WOOD WORKING Digest

ST. LOUIS
APR 4 1955
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APRIL
1955

In This Issue . . .

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Finishing Stories
S.P.A. Convention
First Steps in Quality Control
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Accepted as Controlled Circulation Publication at Pontiac, Illinois

WOOD WORKING DIGEST

222 E. Willow Ave. Wheaton, Ill.

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A HITCHCOCK PUBLICATION

DRIVE STANDARD [illegible] ROUN[illegible]

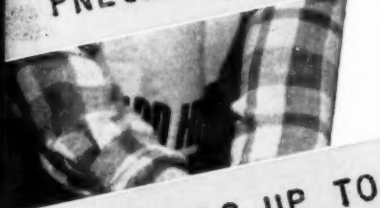
NEW PORTABLE AIR DRIVE SPOTNAILERS AND [illegible]MATICALLY!

[illegible]ne dependable, production-tested Spotpinner auto-matically drives—and countersinks [illegible] familiar round 12 gauge [illegible] millwork [illegible]

SPOTPINNERS EMPLOY NEW HIGH VELOCITY PNEUMATIC PRINCIPLE. DRIVE ALL SPOTNAILS FASTENERS UP TO 1-1/4 INCH WITH 100 LBS. P.S.I. OR LESS. SEE YOUR SPOTNAILS MAN=

The new Spotpinner has a double capacity magazine contained entirely within its virtually indestructible molded frame.

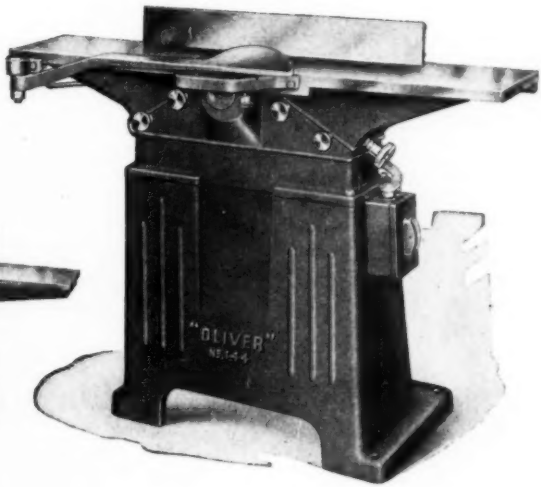
Spotpins—chiselpointed [illegible] check rails and muntins. Spotpins are round, straight (no offset) and cohered in sticks for quick magazine loading.

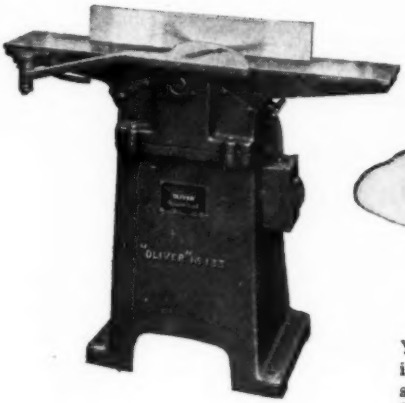


Spotpins are made in standard 7/8", 1" and 1 1/8" sizes.

SPOTNAILS, INC. EVANSTON 1, ILL.

"OLIVER" Jointers are the heavy-type... produce finer work in less time





"Oliver" 6-in. Jointer

This sturdy Jointer is ideal for all classes of small work. Rigid one-piece frame carries tables, cutterhead, motor, fence and guard. Tables raised and lowered by hand knobs and screw. The fence is adjustable across tables and can be tilted up to 45°. Three-knife ball bearing cutterhead. Write for Bulletin No. 133.

"Oliver" 8-in. Jointer

You'll find the "Oliver" 8-in. Jointer a favorite in hundreds of woodworking plants. It is speedy, economical and easy to operate. Smoothly planes stock for perfect glue joints. The work slides easily over the 60-inch polished tables. Three-knife circular safety cylinder runs in self-aligning ball bearings. Bevel fence adjustable from square to 45° across table. Table lowers up to ½ inch for rabbeting. Fitted with new automatic knife guard. Write for Bulletin No. 144.

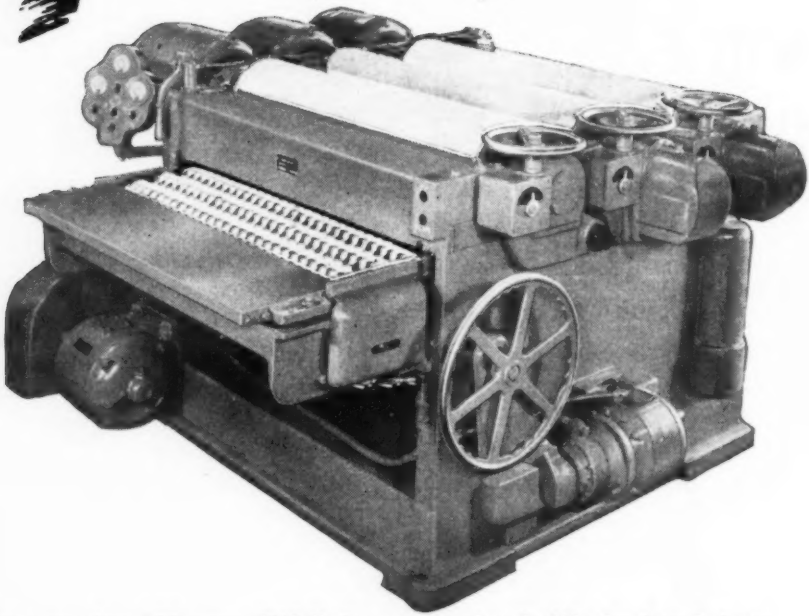
OLIVER

OLIVER MACHINERY CO., GRAND RAPIDS, MICH.

THE SMITH

ENDLESS BED SANDER

WITH SELF-OSCILLATING DRUMS AND VARIABLE SPEED DRIVE, 12' TO 35' PER MINUTE



For more than 107 years, **THE H. B. SMITH MACHINE CO.** has been **OUTSTANDING** in producing the **BEST** in Woodworking Machinery.

The **SMITH** 2, 3 and 4 Drum Endless Bed Sanders are recognized as the **BEST** Sanders thruout the world.

This has been true since the **FIRST** Endless Bed Drum Sander to be introduced to the Woodworking Industry was originated over sixty years ago by the **H. B. SMITH MACHINE CO.**

If you want **HIGH QUALITY** coupled with **QUANTITY PRODUCTION,** if you want **EXTRAORDINARY LONG LIFE,** if you want the **LOWEST MAINTENANCE COST,** you want the best . . . you want the **SMITH** Endless Bed Drum Sander.

Write for Descriptive literature.
AND
Ask about our Lease Arrangement.

H. B. SMITH MACHINE CO.

SMITHVILLE

BURLINGTON COUNTY **NEW JERSEY**

FROM ANY ANGLE A CONVEYORIZED PLANT PRESENTS A PROFIT-MAKING PICTURE

Yes . . . any way you look at it, conveyorizing your woodworking plant is a very smart move. Conveyorizing saves you money while it makes more money . . . through trimming overhead and cutting right through production problems. If you're not yet familiar with the proven advantages of the Walters Line of Conveying Equipment, this coupon will bring you complete information. Inquire today!

Walters Mfg. Co., Dept. WD 10
934 E. Main St., Morristown, Tenn.

Please send me information about the WALTERS "profit-wise" line of conveying equipment.

Name _____

Firm _____

Address _____

City _____ **State** _____

SPECIFY

BEACH

all steel SWING CUT-OFF SAW

These features speed production, cut costs in building construction, maintenance woodwork, lumberyards, crate and box making, pattern making:

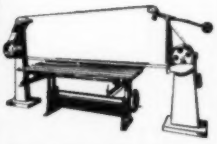
1. Exclusive Beach "quick swing return"
2. Accurate, clear vision cutting control
3. Right or left hand cutting
4. Guaranteed square cutting
5. Special woodworking motor—available in 4 power ratings 3 HP—5 HP—7½ HP—10 HP

WRITE TODAY for complete information and specifications of the Beach Swing Cut-Off Saw.

$475 F.O.B. Factory

Complete with built-in motor

BEACH
MANUFACTURING CO.
MONTROSE, PA.



Hand Block Belt Sander

Shaper

WOOD WORKING Digest

APRIL, 1955
Vol. 57, No. 4

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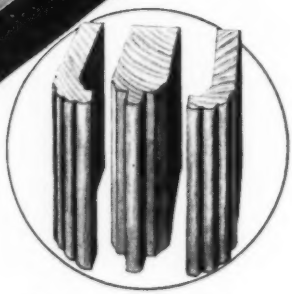
Accepted as Controlled Circulation Publication at Pontiac, Illinois.

Here's how VMT MILLED-TO-PATTERN KNIVES

keep pace with Modern Operations at Bassett Furniture Industries

VMT Milled-to-Pattern Knives used by Bassett can rabbet dresser polystyles, corner posts, etc. at rate of 125 feet per minute—making precision cuts for the life of the tool.



View of rabbeted sections ready for assembly

Bassett Furniture Industries plants depend on Virginia Machine Tool Company to design and custom make milled-to-pattern knives to duplicate, to exacting tolerances, shapes desired in production runs. Slip cutters are used only for cutting samples. Bassett wants three things from a cutting tool (1) fast production (2) clean, sure cut (3) a knife that never changes its shape of cut for the life of the tool. That's why they turn to men with years of know-how who can look at a job to be done, then design and make knives that will meet their exacting requirements.

Bassett Furniture Industries has found VMT knives right for any curved surface, for any piece of wood. They know it's only necessary to sharpen face of knives and they give nick-less surface to take a good finish — eliminating any extra sanding operation. They realize it takes but a matter of set-up minutes and you're ready to cut — up to speeds as fast as 125 feet per minute.

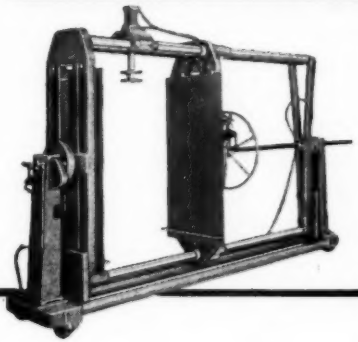
What VMT Milled-to-Pattern knives can do for Bassett, they can do for you. Write, wire or phone us today. Ask for our new catalog — giving you complete details on all VMT wood-working tools.

Virginia MACHINE TOOL CO.

BASSETT, VIRGINIA

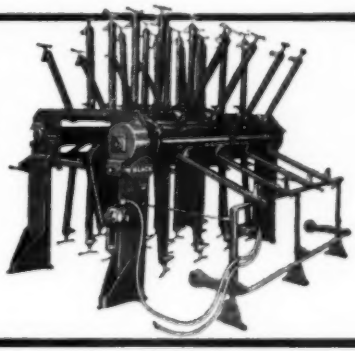
Precision Made Tools For The Woodworking Industry—Standard or Milled To Pattern

Clamps



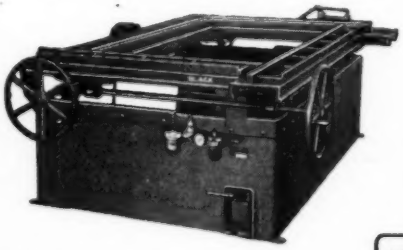
CASE CLAMPS

Massive tubular supports are mounted as fixed preloaded beams that will remain rigid and true, insuring accurate work under any load. No cast iron is used in any strain receiving member. Convenient controls and a powerful brake make operation easy and accurate. Write for Bulletin 11-J.



CLAMP CARRIERS

Black Clamp Carrieres are made in a practically unlimited range of sizes with respect to the number and width of sections and number, length and style of clamps. Carriers are made entirely of arc-welded and fabricated steel, providing an unbreakable frame and permitting flexibility of design. Write for Bulletin 11-K.



SASH AND FRAME CLAMPS

Black's two-way pneumatic clamps are mounted on a rigid, solid steel base with all controls conveniently grouped at the front. Valves and air supply lines are protected from damage by this base. Black clamps have been tested under production conditions, and proven to be fast, efficient and reliable. Write for Bulletin 11-M.

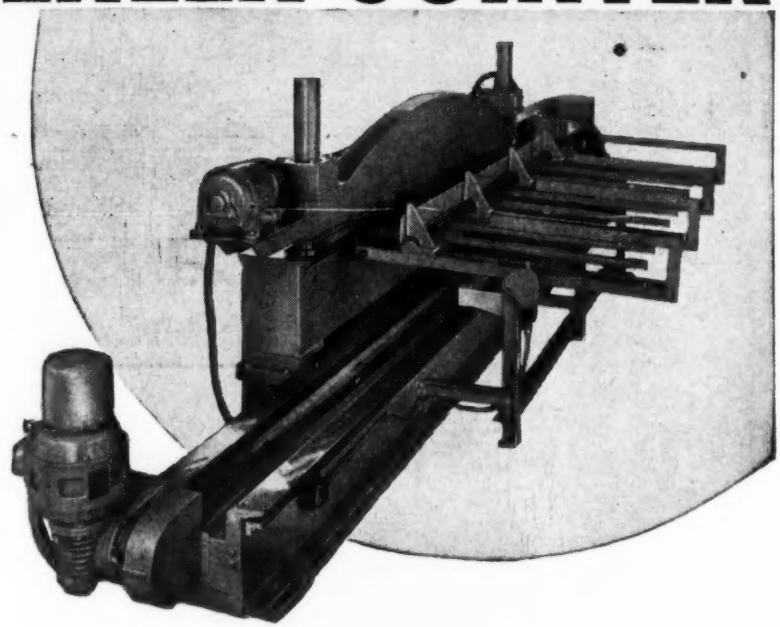
"If its gluing equipment—we have it"

THE BLACK BROTHERS CO., INC. — **810 9th ST., MENDOTA, ILLINOIS**

Mereen-Johnson VENEER JOINTER

Traveling Head Eliminates Shifting —Makes Straight Joints

No chain feed—no stock wobble. It's the most accurate machine available for this type of work. Bundles of veneer up to four inches thick are firmly clamped in the machine. The jointing heads travel past the stock. Equipment includes four knife, round, roughing and finishing heads. Accessories such as swivel mounted roughing motor . . . mechanical loader . . . glue spreading attachment . . . head jointing attachment . . . dust piping . . . are readily available.



6 SIZES:

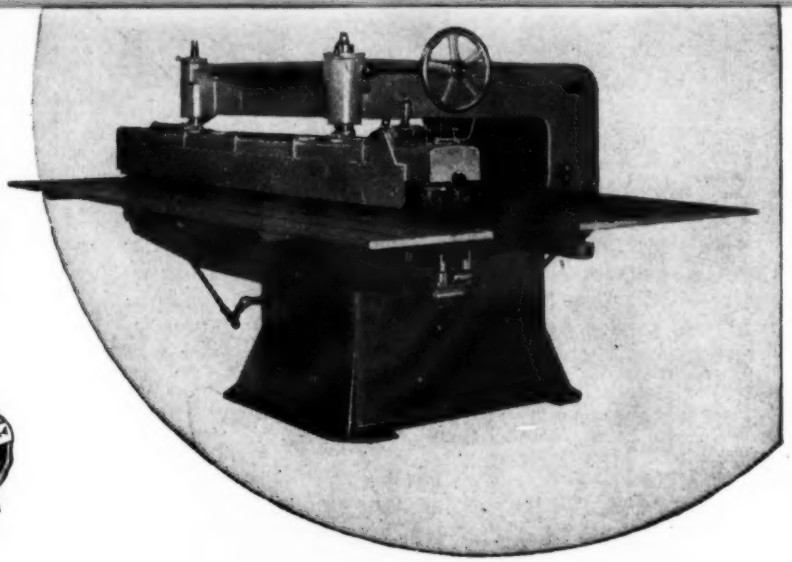
90″, 102″, 126″, 150″, 200″, 212″.

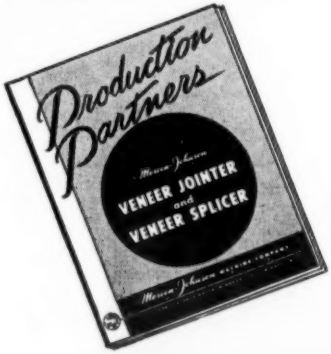
Mereen-Johnson VENEER SPLICER

Precision tapeless joints—self-adjust-

Mereen-Johnson VENEER SPLICER

Precision tapeless joints—self-adjusting for varying thicknesses. About the only adjustment required by this machine is speed variation, regulated from 15 to 120 feet per minute. Either glue or catylist is applied smoothly and evenly by the revolving glue disc at the infeed end. Chains are self cleaning.





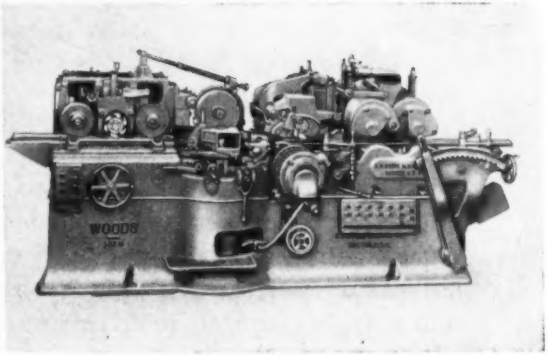
Send for the **JOINTER-SPLICER** *Bulletin*

Mereen-Johnson MACHINE COMPANY

4401 LYNDALE AVENUE NORTH • MINNEAPOLIS 12, MINNESOTA

Serving the Industry Since 1852

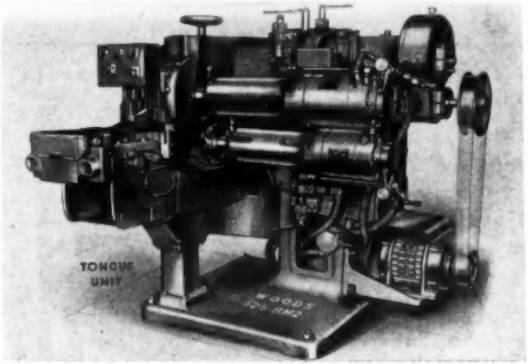
Better Quality Flooring from Units Designed and Built by Woods®



502 M Hardwood Flooring Matcher
100% Ball-Bearing Throughout

A heavy unyielding machine made especially for the production of precision flooring. It is an open type of machine, the flooring strip being visible at all points during its progress. The stock can be easily cleaned out in case of a break-up; an important time-saving factor.

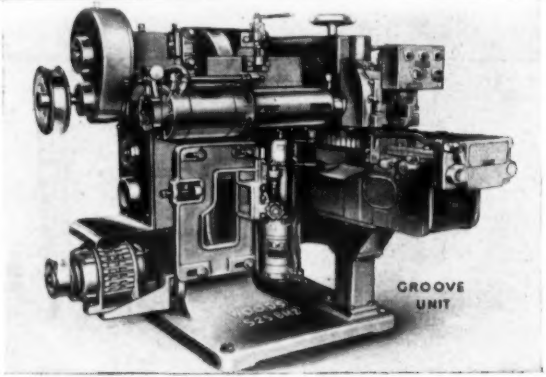
502 M Hardwood Flooring Matcher
100% Ball-Bearing Throughout



525 BM2 Motor Driven Tongue Unit

SAW SPINDLES: Each saw spindle runs in precision ball bearings. Built with direct motor drive on all saw spindles. These units can be furnished belt driven.

CONTROL: Centralized control, convenient to the operator, is furnished. The electric switches with overload relays are housed in a separate metal cabinet.



525 BM2 Motor Driven Grooving Unit

In designing these units, considerable thought has been given to the interchangeability of parts. The natural result of this is less idle time and fewer parts for machine maintenance.

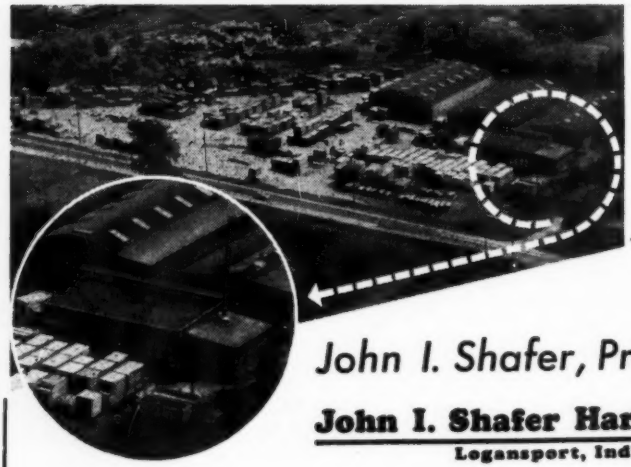
A spring-loaded clutch is built into main drive gear to avoid the possibility of breakage from jams.

Write for full particulars

S. A. WOODS MACHINE CO.

27 DAMRELL STREET

BOSTON 27, MASS.



This is the *Standard* Dry Kiln installation at the John I. Shafer Hardwood Company, Logansport, Ind.

John I. Shafer, President of

John I. Shafer Hardwood Co.

Logansport, Indiana

Writes: "Our first STANDARD Dry Kiln unit was installed in 1935, the second in 1936, and the third, I believe, in 1947. We have dried 1,076 kiln charges of lumber with these kilns averaging just under 40,000 ft. per charge. Everything from Gum and Elm to Mahogany and Walnut has been dried with a very minimum of damage, and many kiln charges come through without a single damaged board. The lumber stays flat and dries uniformly, and frankly, I can't imagine any kilns doing a better job than our STANDARD kilns.

"We purchased our second and third kilns from STANDARD without considering competition, and if we build any more kilns STANDARD will build them!"

Manufacturers of Internal Fan Kilns

Send for free, illustrated Standard catalog

STANDARD

Engineers and Manufacturers Since 1907

DRY KILN COMPANY

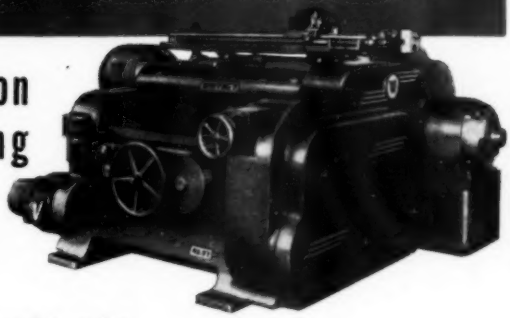
P. O. Box 5708 . . . Indianapolis 21, Indiana

Branch Office: Redman Engineering Service, High Point, N. C.

Nothing Compares with the

WHITNEY 97 DOUBLE SURFACER

For quality production and low cost planing



Whitney 97 Double Surfacer
Feeds: 30 to 90 feet per minute
Planes stock ⅛" to 7" thick
Widths, 30" 36" 40" and 44"

The Whitney 97 Double Surfacer, the last word in modern planer design, is built to handle your double surfacing requirements. Its rugged proportions and faster feeds permit it to handle easily the volume production required in today's modern plant. Traditional Whitney accuracy and careful workmanship assure smooth, accurate planing, continuous production, low cost maintenance and the stamina to produce best results under the severest kind of service.

The Whitney 97 will bring to your plant a new conception of production efficiency and cost savings. High production quotas will be maintained and sanding and finishing costs substantially reduced. Investigate today the Whitney 97 for your double surfacing requirements. Write for full particulars. Ask for planer bulletin **D 1.**

Check these features

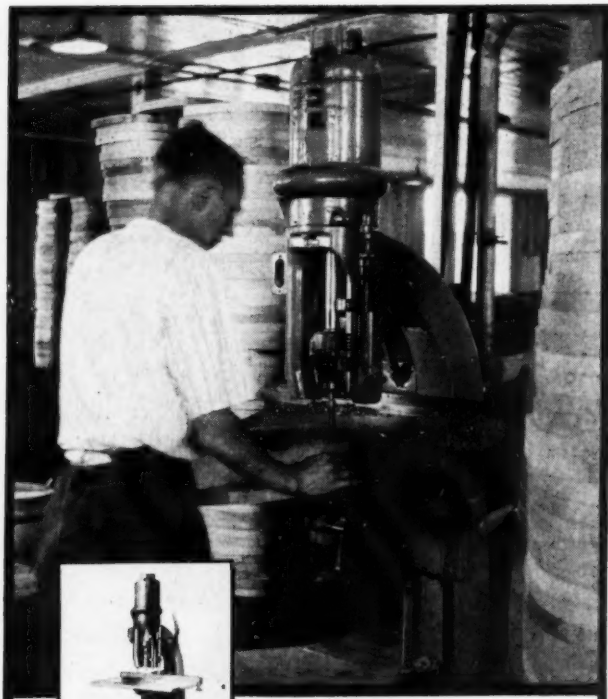
- Wedge Construction
- Nitralloy Center Table
- Ball and Roller Bearings thruout
- Motor Raising and Lowering of Bed
- Built-in Variable Speed Feed
- Micro-feed Selector
- Automatic Power Feed Grinder

Planer Specialists
FOR MORE THAN 100 YEARS

In our 117th year

Baxter D. Whitney & Son, Inc.
WINCHENDON, MASSACHUSETTS, U. S. A.
Quality Built Woodworking Machinery Since 1837

PLANERS • SHAPERS • AUTOMATICS • VARIETY SAWS • BACK KNIFE LATHES



EASILY OPERATED, HIGHLY ACCURATE

. . . Greenlee Electric Borer

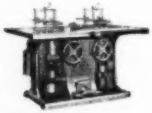
It takes very little experience to do an *accurate* job with the GREENLEE 356 Electric Single-Spindle Borer. No belts, no gears. Foot-feed lever, and auxiliary hand lever for use when desired, provide complete control. Ball bearing, moving with the bit spindle, provides full support throughout the entire stroke. Frame and base are of rugged construction for perfect stability. Fully enclosed motor has a built-in blower for forced ventilation and a directed air blast to clear chips. This *versatile* GREENLEE Borer has excellent range for furniture, radio and television cabinet, or similar work . . . operates bits up to 1½-inch size in hardwood with stroke adjustable up to 10 inches. Get complete details now.

GREENLEE BROS. & CO.
1864 Twentieth Avenue, Rockford, Illinois

GREENLEE WOODWORKING MACHINERY AND TOOLS The GREENLEE line of woodworking machinery includes, tenoners, mortisers, borers, saws, planers, and shapers.

GREENLEE DOUBLE-END TENONER . . . often called "a woodworking plant in itself." Renowned for quick, easy setup and wide versatility. Single-end Tenoners also made by GREENLEE.

GREENLEE SIX-ROLL SINGLE PLANER . . . exceptionally smooth in operation. One of a line of single and double planers for fine work, high production.



GREENLEE MOTOR-DRIVEN SHAPER . . . all-around unit for high-speed, precision shaping. Double-spindle type, needs no separate frequency changer.

MORTISING AND BORING TOOLS . . . Countersinks, Hollow Chisels, Multi-Spur Bits, Machine Bits and other tools by GREENLEE mean top production from your woodworking machines.

GREENLEE

Fast Delivery on 276 standard sizes and types of Weldwood Hardboard!

Nominal Thickness Inches	Standard Sizes Feet	Average Caliper Inches	Aver. Wt. Lbs. per Sq. Ft.
	Weldwood Standard Hardboard		
1/10	4 x 12	.104	.59
1/8	4 x 16 down to 4 x 1	.134	.75
3/16	4 x 16 down to 4 x 1	.186	1.02
1/4	4 x 16 down to 4 x 1	.242	1.33
5/16	4 x 12 down to 4 x 1	.310	1.67
	Weldwood Tempered Hardboard		
1/10	4 x 12	.104	.62
1/8	4 x 16 down to 4 x 1	.134	.78
3/16	4 x 16 down to 4 x 1	.186	1.08
1/4	4 x 16 down to 4 x 1	.242	1.40
5/16	4 x 12 down to 4 x 1	.310	1.75
	Weldwood Black Tempered Hardboard		
1/10	4 x 12		
1/8	4 x 12 down to 4 x 1	.134	.78
3/16	4 x 12 down to 4 x 1	.186	1.08
1/4	4 x 12 down to 4 x 1	.242	1.40
	Weldwood Prime-Coated Hardboard		
Standard 1/8	4 x 12, 4 x 8	.134	.75
Wolltuf 1/4	4 x 12, 4 x 8	.240	1.17
Tempered			
1/8	4 x 12, 4 x 8	.134	.78
3/16	4 x 12, 4 x 8	.186	1.08
1/4	4 x 12, 4 x 8	.242	1.40

Nominal Thickness Inches	Standard Sizes Feet	Average Caliper Inches	Aver. Wt. Lbs. per Sq. Ft.
	Weldwood Standard Dekalux		
1/8	4 x 12 down to 4 x 1	.132	.85
3/16	4 x 12 down to 4 x 1	.182	1.09
	Weldwood Tempered Dekalux		
1/8	5 x 16 down to 4 x 3	.132	.85
3/16	5 x 16 down to 5 x 5; 4 x 16 down to 4 x 3	.182	1.09
1/4	5 x 16 down to 5 x 1; 4 x 16 down to 4 x 1	.243	1.55
	Weldwood Wolltuf Hardboard		
3/16	4 x 16, 4 x 12, 4 x 10, 4 x 8	.180	.90
1/4	4 x 16, 4 x 12, 4 x 10, 4 x 8	.240	1.17
	Weldwood Dekatile		
1/8	4 x 16 down to 4 x 3	.134	.84
	Weldwood Dekaleather		
1/8	4 x 16 down to 4 x 3	.138	.84
	Weldwood Dekaply		
1/2	4 x 8	.500	2.45
3/4	4 x 8	.750	3.75
	Weldwood Perfoboard		
1/8	4 x 8 down to 4 x 1, 2 x 2	.134	.75
3/16	4 x 8	.186	1.02
1/4	4 x 8	.242	1.33

Nominal Thickness Inches	Standard Sizes Feet	Average Caliper Inches	Average Weight Lbs. per Sq. Ft.
	Weldwood Hardboard Exterior Siding		
1/4	12" x 8', 12" x 12', 12" x 16', 16" x 8', 16" x 12', 16" x 16', 24" x 8', 24" x 12', 24" x 16'	.242	1.40
5/16	12" x 8', 12" x 12', 12" x 16', 16" x 8', 16" x 12', 16" x 16', 24" x 8', 24" x 12', 24" x 16' (Sizes in inches and feet)	.310	1.75

In addition to this wide range of standard sizes, we offer direct mill shipments of Weldwood Hardboard cut to your specifications.

When you order hardboard, ask for Weldwood Hardboard. It costs no more and you get immediate delivery on most items. For details call any of the 73 United States Plywood distributing units in principal cities. For a complete listing of Weldwood Hardboards and information on working and finishing hardboard, send the coupon.

WD-4-55

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A product of

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Please send me FREE Weldwood Hardboard booklet.

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Diehl Moul

All-electric, Ball-bearing

NEW FEATURES DESIGNED TO CUT YOU

Diehl

Standard of Comparison of the Woodworking Industry

New Variable Speed Drive
Controlled from front of machine; provides standard feed speeds from 20 to 151 fpm; 7.9:1 ratio. Optional speeds to 387 fpm.
Exclusive Diehl Integrated Spindle
Super-precision bearings 2" closer to motor, ½" closer to cutterhead, provide bearing support closer to load area. Spring preloading prevents both end and radial play.
New Motor Controls
Push-button controls — for both spindle motors and feed motors — located in face of machine at infeed end.
New Feed Works Assembly
Permits use of short feed belt to reduce possibility of feed works vibration or flutter.

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UT YOUR COSTS !

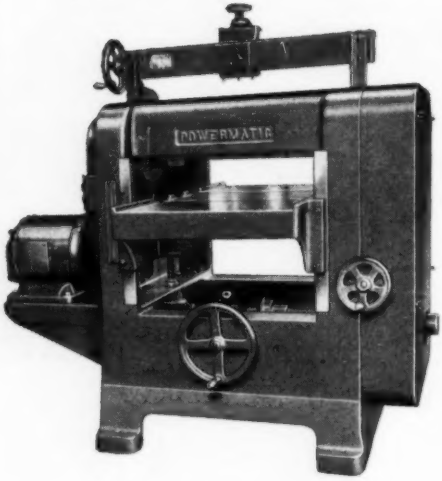
Quantity output? Here is an all-new moulder designed for continuous operation at high speeds . . . with every built-in feature you've wanted in a moulder to streamline set-up and adjustment time, *to minimize interruptions.* The new Diehl Moulder is a massive, heavy-duty, *precision-built* machine. Every construction feature is planned and proven for true, steady operation . . . *for mass-production moulding.*

Quality output? No other moulder offers greater freedom from vibration under all conditions. Why? First, because no other moulder has the exclusive Diehl Integrated Spindle . . . eliminating the problem of outboard bearings . . . and long-proved for its ability to operate at higher speeds on heavier cuts *without spindle whip.* And second, because no other moulder offers the overall ruggedness, the lasting precision, of the *new* Diehl Moulder.

But write today for all the *facts* on the new Diehl 6 and 8 Inch Moulders, *designed to cut your operating costs.* Request Bulletin No. M-155. *And contact your Diehl Representative!*

THE G. M. DIEHL MACHINE WORKS, INC. • WABASH, INDIANA

Look To The Future with a POWERMATIC 220-20'' SURFACER



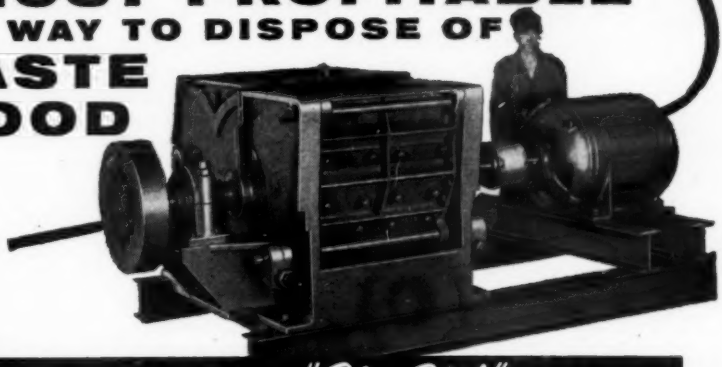
P—Power to spare
O—Operationally perfect
W—Well built
E—Efficiently Engineered
R—Reasonably priced
M—Mechanically Perfect
A—Accuracy plus-
T—Tough (built to take it)
I—Ideal for all situations
C—Compact and convenient

The Woodworker of today must look to the future in selecting shop equipment. He endeavors to secure the best, safest and most efficient machine at the lowest possible price. He looks for equipment that will give trouble free service in the years to come. With this in mind, we have developed the Model 220-20" Single Surfacer, which meets and exceeds the requirements of the average woodworker. Available in both direct and belted drive, this machine is fully guarded and standard equipped with sectional feed roll and chipbreaker insuring safety in operation. No longer must the operator constantly fear the dangerous "kick back" common in solid roll machines, but may without danger, feed different width and thickness material through at the same time. Extremely heavy cast iron construction keeps machine in perfect alignment and performing perfectly throughout the years. By all means check the many features of this machine before you buy. Free literature sent upon request.

Manufactured By

POWERMATIC MACHINE COMPANY
McMinnville, Tennessee

MOST PROFITABLE WAY TO DISPOSE OF WASTE WOOD



WILLIAMS "No-Nife" HOGS

MAKE UNIFORM CHIPS FOR CHIP BOARD. Williams Hogs operated in closed circuit with Williams Vibrating Screens reduce wood offal to exactly the proper size chips for chip board, wall board or other profitable by-products.

CONVERT WOOD REFUSE INTO VALUABLE FUEL. Refuse, not otherwise usable is cheaply hogged for more complete combustion. Unhogged wood restricts air flow, smothers the fire, burns unevenly, creates excessive smoke. Williams equipment also reduces handling costs as much as 75%. When hogged, one man can handle as much as three men can handle in long, cumbersome pieces.

WILLIAMS CAN SUPPLY COMPLETE EQUIPMENT for the conversion of wood offal into wood flour, insulation or any of the new and more profitable uses of wood.

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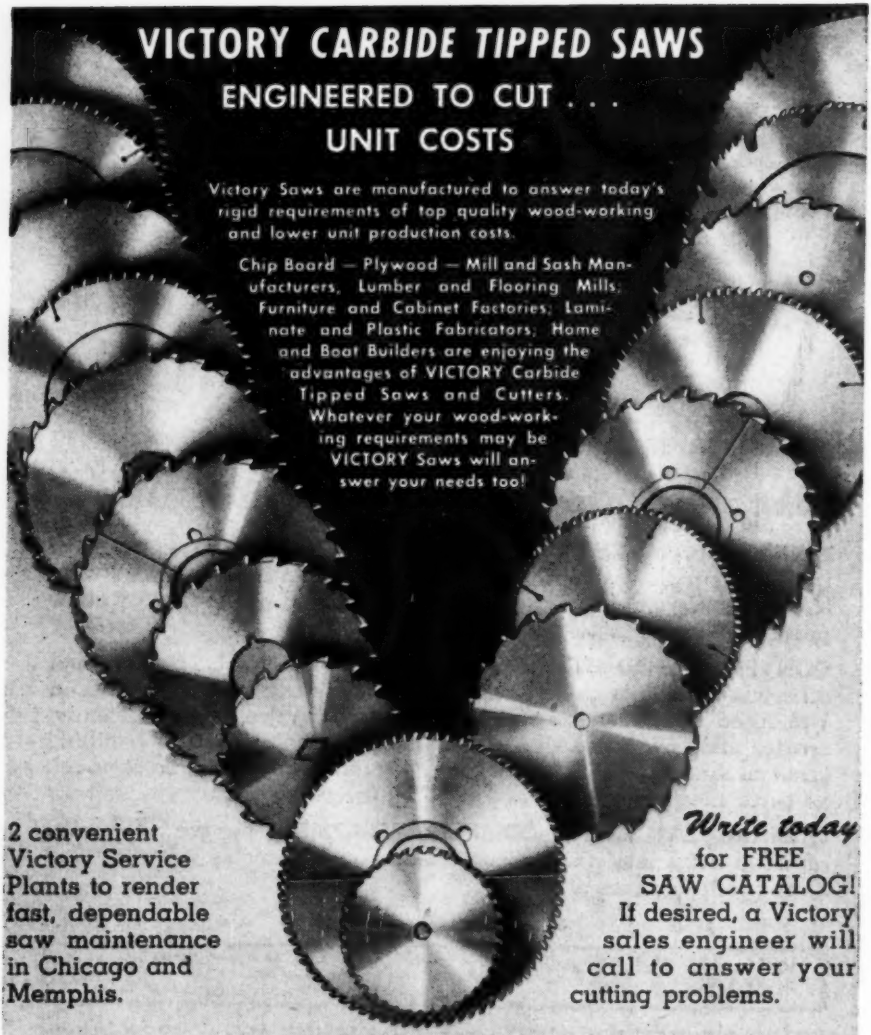
ENGINEERED TO CUT . . . UNIT COSTS

Victory Saws are manufactured to answer today's rigid requirements of top quality wood-working and lower unit production costs.

Chip Board — Plywood — Mill and Sash Manufacturers, Lumber and Flooring Mills; Furniture and Cabinet Factories; Laminate and Plastic Fabricators; Home and Boat Builders are enjoying the advantages of VICTORY Carbide Tipped Saws and Cutters. Whatever your wood-working requirements may be VICTORY Saws will answer your needs too!



2 convenient Victory Service Plants to render fast, dependable saw maintenance in Chicago and Memphis.

Write today for FREE SAW CATALOG! If desired, a Victory sales engineer will call to answer your cutting problems.

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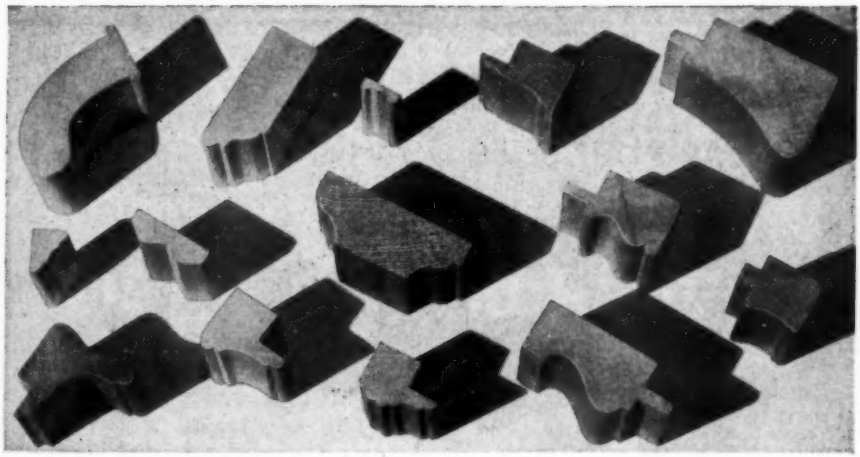
38 Years of Service to the Woodworking Industry



Longer-lasting 3M Garnet Cloth Belts sand any moulding shape better, faster!

Note the intricate contours of these mouldings, the sharp "knife" edges and valleys. Sanding shapes like these is a tricky job—done perfectly with 3M Garnet Cloth Jean belts.

3M Garnet Cloth belts are faster-cutting than ordinary mould sanding belts, and longer lasting. Reason for this is superior grain anchorage, making them resistant to mineral peeling, the commonest problem in mould sanding.

And 3M Garnet Cloth belts are more conformable—they flow smoothly over a "knife," retain their shape far longer than ordinary belts. Perfect for fixed, hand or automatic sanding, they require only light pressure because of their extra sharpness. The *belt* does the work.

Yes, for any mould sanding job, you'll be money ahead with 3M Garnet Cloth Jean belts—longer-lasting, faster-cutting, more conformable than any other moulding sander belt on the market today. Be sure to specify 3M every time you order. For further information send for booklet "3M System of Furniture Finishing," using coupon below.

The final finish mirrors all previous operations

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Made in U.S.A. by Minnesota Mining and Mfg. Co. General Offices: St. Paul 6, Minn. In Canada: London, Ont., Can. Export: 122 E. 42nd St., New York City. Makers of "Scotch" Brand Pressure-Sensitive Tapes, "Scotch" Brand Magnetic Tape, "3M" Adhesives, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip Surfacing.

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Pride in product is the common denominator of the hundreds of manufacturers who use Woodlife—and *only* Woodlife—to give their products basic protection against . . . . . *Moisture and water absorption, decay, swelling, shrinking, warping, checking, grain raising and termites.*

These manufacturers know that Woodlife quality is underwritten by over 30 years of continuing research in the most active chemical and testing laboratories in the water repellency field.

If you have pride in *your* products and don't know about Woodlife—*you should!* Protection Products engineers will be glad to work with you to develop the most economical Woodlife treatment method for your specific application. Send for the informative folder, "WOOD PRESERVATION WITH WOODLIFE".

WRITE

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MANUFACTURING COMPANY
Since 1921
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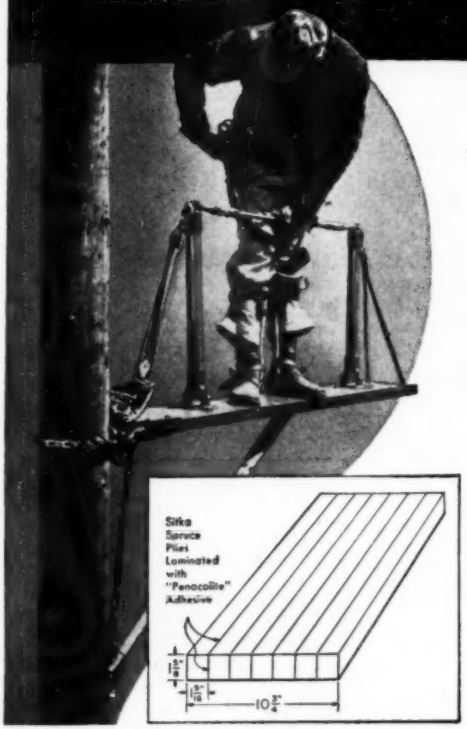
For LASTING STRENGTH

through all kinds of weather this platform is laminated with

PENACOLITE® ADHESIVES



"Penacolite" Adhesives were specified for this lineman's platform by Bodendieck Tool Company of Taylorsville, Illinois – veteran suppliers to the utility field – because the strength of the platform *has* to be constant despite long exposure to varying weather conditions. Rain, humidity, high and low temperatures will not weaken "Penacolite" bonds.

Laminating with "Penacolite" Adhesives provides bonds as strong as the woods they join without adding appreciable weight. This platform—constructed of 1¾" thick plies of spruce—weighs only 32 pounds, yet has a high breaking load capacity.

"Penacolite" Adhesives are easy to use and cure quickly – in a few hours at room temperature (70°) or in just a few minutes when accelerated by heat. If you would like more information on this Koppers product, write for our free, illustrated booklet on "Penacolite" Adhesives.

KOPPERS COMPANY, INC.

Chemical Division, Dept. WWD-45

Koppers Bldg., Pittsburgh 19, Pennsylvania

PENACOLITE® RESORCINOL ADHESIVES

The original waterproof, room-temperature-setting adhesives

KOPPERS®

ACCURATE PRECISION GRINDING

WITH DEPENDABLE'S LOW-COST NO. 106-A

Illustrated with side-head grinding attachment, capacity up to 12" in diameter.

NEW PRECISION GAUGE . . . Equipped with Dependable's G-11 precision gauge. So easy to operate that even an inexperienced operator gets a perfect grind. Set-up takes only a few seconds. Because of accuracy, less knife surface is ground away on expensive knives. Saves you up to 50% of knife replacement costs.

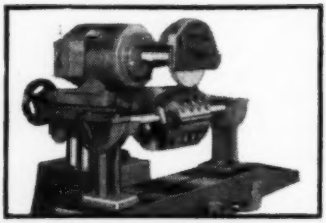
BALL-BEARING TABLE . . . Made to machine tool standards for ease of operation. 200 lb. table travels 20 inches and can be controlled by your little finger through a handwheel.

EASY ADJUSTMENTS . . . All adjustments reached from front, while grinding.

RUGGED CONSTRUCTION . . . Extra heavy castings eliminate vibration and give smooth operation.

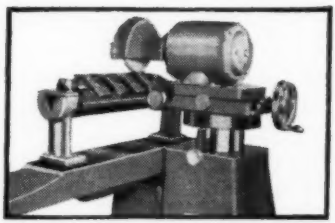
FULL UNIVERSAL . . . Motor base assembly turret mounted to give 360 degree adjustment for straight or hollow grind. Full universal side head stand for grinding knives with any angle.

LOW IN PRICE . . . You'll be pleasantly surprised at the low cost of the Dependable No. 106-A.



MOULDER HEAD ATTACHMENT
For all types of moulder and profiler heads of slip-on type; Up to 12" in diameter and 15" long.

Write for Free Copy of Bulletin C-7 and name of your nearest dealer.



STRAIGHT KNIFE ATTACHMENT
For grinding thick and thin knives up to 20 inches long. Knife plate grooved for quick set-ups.

Dependable MACHINE COMPANY

WOODWORKING MACHINERY

GREENSBORO, NO. CAR., U.S.A.

"The Skating Coles," and their portable floor of Masonite Tempered Presdwood.

Punished by Professionals . . .
Presdwood Shows Off Its Stamina

'Round and 'round they go . . . thrilling their audience night after night, week after week. The floor they skate on has to be strong and durable. And super-smooth, without sudden splinters or cracks. For safety's sake, they use rugged Masonite Tempered Presdwood.

The stamina of this dense, all wood hardboard is well known to many manufacturers. So are its superior fabricating qualities, its freedom from knots and grain, its ability to take and hold a great variety of finishes.

Masonite® research has developed a total of 44 distinct types and thicknesses of Presdwood®. One or several of these may be just what your product designers are looking for. Why not let a trained Masonite Sales Engineer help you find out, at no obligation, of course. Write Masonite Corporation, Dept. WWD-4, Box 777, Chicago 90, Illinois.

Choose This Man—He Makes The Difference

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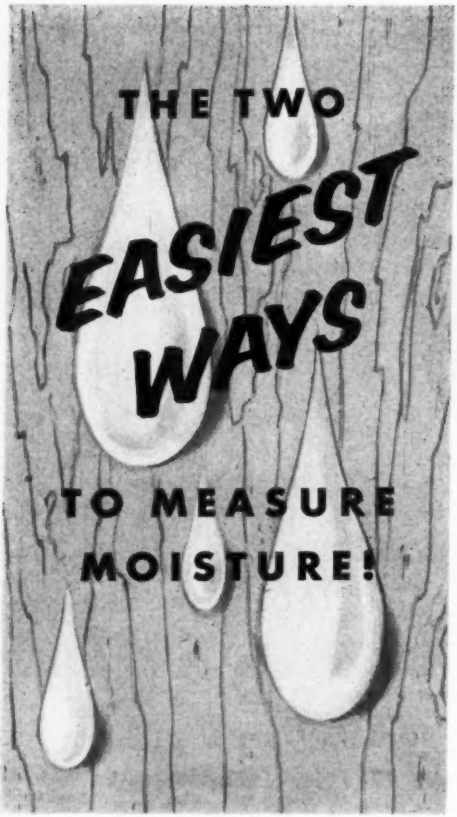
MANUFACTURER OF PRESDWOOD PANEL PRODUCTS

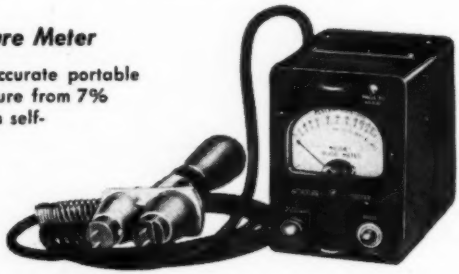


WESTON *ALL-PURPOSE*
MOISTURONIC
Moisture Meter

Here is the most versatile moisture meter, yet the simplest and easiest to read. Measures up to 150% moisture on the double-range scale (readings above 30% for comparative purposes). Utilizing the precise resistance principle, it has the same dependability typical of all WESTON instruments. Available in both battery and A-C types, with a sturdy carrying strap. Weight less than 10 lbs. Send for bulletin W7B.

WESTON *Midget Moisture Meter*

The smallest, most convenient and accurate portable meter. Instantly indicates wood moisture from 7% to 30%. Weight less than 4 lbs. with self-contained batteries. Unequalled for quick, portable use—checking lumber, lath, shingles, plaster walls, plywood, etc. Send for bulletin W2C.



WESTON *Moisture Meters*

WESTON Electrical Instrument Corporation, 614 Frelinghuysen Ave., Newark 5, N. J.

how to SPLICE WOOD AT GREAT SAVINGS . . .

You'll find some startling, yet proved facts in Saranac's new Bulletin 112-A on Corrugated Fastener Drivers

Model 1RA Splicer joins boards of any length for ammunition boxes, etc. Fasteners are cut and driven instantly, from standard ribbon stock shown feeding from reel.

Here are some of the Bulletin's contents:

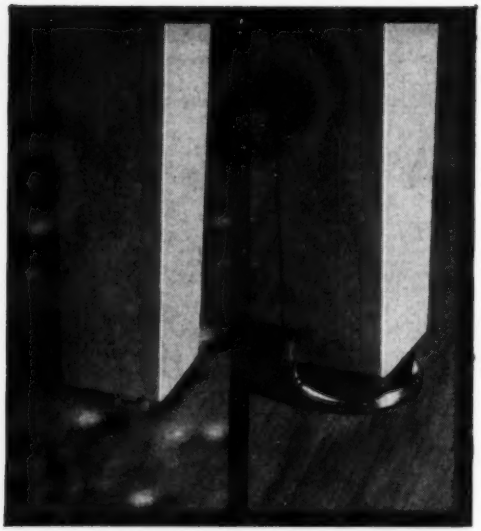
1. Large production with one operator, compared to hand driving.
2. Savings in cost of fasteners, year after year.
3. Description of two Splicer Models.
4. Versatility in driving narrow, wide, long or short fasteners — in hard or soft wood.
5. Range of work you can do — from production jobs to reclaiming scrap wood.

This Saranac Splicer may pay you big dividends . . . write for your copy of Bulletin 112-A — Today!

SARANAC MACHINE COMPANY

Manufacturer of the World's Largest Line of Fastening Machinery

BENTON HARBOR, MICHIGAN



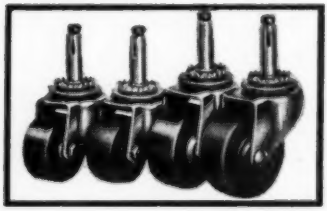
Dimple digging doesn't sell furniture

Put your furniture's best foot forward for greater sales

Smart manufacturers are discarding furniture buttons in favor of broad-based, smooth-sliding Bassick Rubber-Cushion Glides — they can't harm the finest floor.

Add this big, low-cost sales feature to your furniture now. The Bassick Company, Bridgeport 2, Conn. *In Canada:* Belleville, Ont.

"Diamond-Arrow" Casters move chairs, tables, stands, TV sets at a touch. Double-ball design makes swivelling easy.



ADVERTISED IN The Saturday Evening POST

Bassick

A DIVISION OF STEWART SW WARNER

MAKING MORE KINDS OF CASTERS ...MAKING CASTERS DO MORE

AUTOMATION
And the Woodworker

From time to time words have come into the industrial vocabulary promising to bring havoc and confusion. I am reminded of a time when the the word "technological" threatened to throw the average laboring man out of a job. Industry was going to be run as a science! This was many years ago and certainly the laboring man is still hard at it!

Currently we have heard a great deal about "automation." In fact, some enterprising publisher has issued a little booklet to allay the working man's fears and to show how automation creates jobs.

What is automation? First, it is any automatic mechanism that imitates actions of human beings; secondly, it is anything that is capable of spontaneous movement or action. There are many ways in which automation can be used in woodworking.

In fact, it would seem that we have already accepted automation to some extent. Maybe we didn't know how scientific and educated we were getting! The chances are that we have accepted new automatic machinery as a better way to do the job; as a logical method of increasing production and profits.

Here are a few of the new ways we are now using automation. One prominent veneer and lumber manufacturer has used closed circuit television in supervising some of his operations. Successful barking operations are being carried on with the use of two consoles containing push buttons to control occasional operations. The barkerman sits between the two consoles and uses a device immediately before him which is called an airplane wheel control. By turning the wheel to the right, the trunnion rolls turn to the right, etc. The use of electric eyes is another subject that should be more fully investigated. They could possibly be used in some sorting operations and as safety devices.

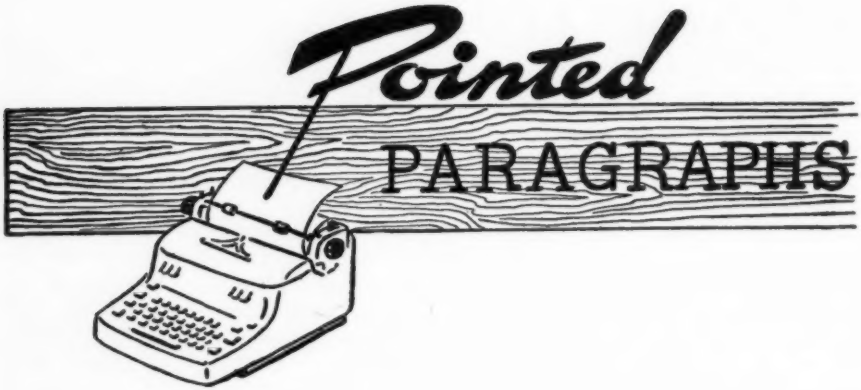
It is hoped that this subject will be discussed more fully at some of the lumber conventions and association meetings scheduled for this year.

This month the Southern Pine Association will be holding its third annual machinery exposition at New Orleans. Here is still a different kind of opportunity to study possibilities for automation. Lumber manufacturers of all kinds can see and evaluate equipment used in logging, sawmilling and woodworking.

Each month the pages of WOOD WORKING DIGEST are filled with information from our advertisers showing the latest in machinery, equipment and supplies. All of these folks are glad to answer questions and send literature to a sufficiently interested reader.

Automation is here to stay. Let's make it serve the woodworking industry to the best advantage.

E. McDaniel
Editor



Hardwood Plywood Institute has set up an unique sample booklet for dealer use. There are 28 "wood" pages—each one a thin sheet of genuine hardwood. Twelve popular plywood species are represented and samples show different methods of cutting or slicing the veneer and the resulting grain patterns. The samples are permanently protected with mar resistant clear plastic pressed into the wood itself.

The Western Pine industry produced and shipped approximately eight billion board feet of lumber during 1954—a new record for both production and shipping.

The U. S. Forest Service has recently established a research center in eastern Kentucky. Called Berea Forest Research Center, it is one of five such centers operated by the Central States Forest Experiment Station, Columbus, Ohio. Research will emphasize forest management.

The National Hardwood Lumber Association announces another training school to begin September 8. Ordinarily the fall term opens on July 1, but the change is being made this year at the request of association members. Fifty were graduated in February. Next month WOOD WORKING DIGEST will carry an article on the school and its work.

Be sure to let us know how you like the new feature "Right or Wrong." This, along with the Kiln Forum and other features, has been planned with your interests in mind.

In order to maintain its place as a major industry, the forest products industry needs technically skilled men. The Education Committee of the F.P.R.S. is working on this general problem to see what types of training need to be offered; to secure industry cooperation and to recruit students.

Save Time Save Money

use

DUO-FAST automatic TACKERS

DUO-FAST AIR TACKERS cut production costs on case backs, drawer guides, and numerous other jobs.

MORE WORK, in less time, using fewer workers—that's the story on Duo-Fast Automatic Tackers and Staplers.

WIDELY USED in cabinet and woodwork shops, furniture plants, sash and millwork factories, toy makers, for a wide variety of fastening jobs.

A COMPLETE LINE of AIR TACKERS, HAMMER TACKERS, GUN TACKERS, STRIKE TACKERS, and AIR STAPLERS, including the model to save you time and money.

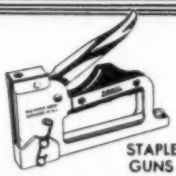
DUO-FAST GUARANTEE assures you of free service on Duo-Fast machines. An important money-saving feature.

DUO-FAST HAMMER TACKERS speed and simplify many tacking jobs. One-hand operation.

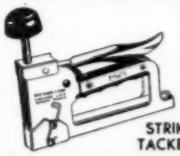
50 Sales & Service Offices in Principal Cities

WRITE TODAY FOR YOUR COPY OF THE DUO-FAST CATALOG & PROFITABLE SUGGESTIONS

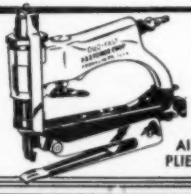
The *right* machine for each job is important. You'll find the *right* one in the **DUO-FAST LINE**



STAPLE GUNS



STRIKE TACKERS



AIR PLIERS

FASTENER CORPORATION

858 Fletcher Street • Chicago 14, Illinois

The third Southern Pine Association Machinery and Equipment Exposition will be held in conjunction with the association's 1955 annual meeting, April 4-6. This issue features the S.P.A. meeting with complete details on program and exhibitors.

The new National Housing Center will open August 15. The center is located at 1625 L St., N.W., Washington, D.C., and will bring under one roof a spectacular exhibit of the building components that go into the construction and fitting out of the American home.

Word comes from Sussex, England, that wood is being successfully dried in a radio frequency heating plant. The birch pieces for broomheads are loaded into a gravity-operated magazine which feeds them onto a variable speed conveyor belt of dielectric material. This carries them through an electrode system 9' long by 1' wide, which accommodates 30 broomheads at a time.

Action taken at the recent National Woodwork Manufacturers Association include plans for revising commercial standards; testing of stock doors; further research; and a continued campaign to insure that government specifications do not discriminate against wood products in government building programs.

Hardwood flooring demand, as reflected in shipments from the nation's major producing areas, reached an all-time high in 1954. This record output indicates a significant trend in new dwelling construction. Oak floors have been steadily growing in popularity ever since the end of World War II.

Oregon State College has completed experimentation to show that orchards can be protected against frost by use of sawmill residues. Several methods of burning the slabs and edgings have been tried. Wood fuel burning with less smoke and at a lower cost than oil, without high investments in burners, may be a boon to farmers and provide an outlet for sawmill residues now burned at the mills.

Housing starts continue high. January-February total is 30% up over 1954. February was the tenth successive month of new monthly highs according to the Dodge Report.

The Hardwood Plywood Institute, along with many others, is keenly aware of the importance of the tariff situation now before the Senate. U. S. Department of Commerce officially reports the United Kingdom export trade reached an all-time high in 1954 with the upturn in exports to the United States.

Attorney for the hardwood plywood industry supplies the following annual figures: Total imports for 1954, 434.5 million sq. ft.; total domestic production 715.4 million sq. ft. Imports represented 37.8% of the total market for 1954; dollar value of imports, $32.9 million.

You may have spent enough to pay for an AMF De Walt machine... but

DO YOU OWN ONE?

New Model GW-I 10" Saw with FULL 1½ H.P. Motor . . . complete for only $395 DELIVERED (custom-built 1½ H.P. motor, 10" saw blade, 4 detachable steel legs included)

Even if you've invested as little as $239 in shop equipment you may not be enjoying the profit-making benefits of a De Walt®. We invite you to compare your present equipment and shop methods with these AMF De Walt features and operating advantages:

- One low-cost machine that does ALL the work of a swing saw, straight line cut-off and miter saw, table-type rip saw, dado machine, shaper plus many others.
- Savings of up to 60% or more in capital equipment investment alone.
- 75% savings in floor space alone! AMF DeWalt can be placed against any shop wall—instead of in the center of the shop.

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Comments from THE NATION'S CAPITAL

By Arnold Kruckman
Washington Correspondent

Wood schools stretch the school building dollars, says National Lumber Manufacturers Association Executive Vice-President Leo V. Bodine. He emphasizes that the evidence, in local building costs per square foot, is being put into the hands of school authorities throughout the country. The study available shows:

Exterior classroom walls, of other types of construction, cost up to 58% more than construction principally of lumber and wood products.

He shows that for room-corridor partitions finished one side, other types of construction cost up to 200% more than that principally of lumber and wood products. For room partitions finished on both sides, other types of construction cost up to 167% more; classroom roofs, of other construction, up to 64% more; exterior auditorium walls, of other types, up to 236% more, and for auditorium roofs, of other types, up to 124% more.

The NLMA study, prepared by E. H. Boeckh and Associates, has in mind meeting the problem of the estimated need for the new classrooms in 1960. Obviously, the survey and the information has an emphatic influence on the $7 billion school program proposed by the President in his recent message to Congress.

This colossal program has an enormous significance to practically all parts of the woodworking industry. It is easy to gather that an infinite number of the materials required, and the equipment which must be supplied for the proposed schools in many cases, should be made of wood, and in other cases can easily be transmuted from other materials into wood – if the industry goes after the business.

It is necessary to understand the program as it has been outlined by Mrs. Oveta Gulp Hobby, Secretary of Health, Educa-

tion and Welfare, in order to realize the opportunities. In the 48 states there are 63,000 school districts. Over 11,000 have had so few children they did not operate schools. In some instances the children were transported to adjoining districts.

Mrs. Hobby states that 31,000 districts, or close to half of the total, each have less than 50 pupils. Another 12,000 have 50 to 300 pupils each. It is at these thinly populated districts that the proposal to spend $7 billion is particularly aimed. The President and his advisors believe these are the districts either with children or with potential school population that must have adequate school buildings and equipment.

The Federal Government intends to build 200,000 classrooms for 6 million children as swiftly as possible.

Today many of the backward areas, scholastically speaking, hold classes in cellars, basements, washrooms and in other similar spots, the character of which seem almost incredible when you see them listed. Bear in mind considerable additional construction is to be launched in addition to this program; and this added construction is to be spurred into action concurrently with that heretofore discussed.

We are told that the 90,000 classrooms needed most desperately and urgently will cost $3 billion, or more, and these do not include the 210,000 classrooms required to replace the majority of unsafe, or outmoded schools, that have accumulated dangerously over the years.

Mrs. Hobby's Commissioner of Education—a Federal official—estimates the nation must provide 50,000 classrooms for approximately 1,500 million school children each of the coming years, merely to keep up with the increasing enrollment during the next ten years. This should make clear the school construction program means business to all those who have anything that is required to bring the schools into existence, or who have the imagination to make the plans for the services and the materials and the equipment they should offer during at least the next 15 to 20 years. And this construction must go forward as swiftly as possible.

Simultaneously it will be necessary to replace 8,000 classrooms, annually, housing approximately 240,000 children, because these particular classrooms inevitably will deteriorate and become unsafe or otherwise unsuitable from year to year. During this current school year, for instance, the new classrooms under construction are expected to be at least sufficient to house approximately 1,800 million, at a cost of more than $2 billion. It should be almost needless to comment that both Federal and other agencies stress that this is an all-time high in school construction.

We are urged particularly to suggest to those who supply the services and the material to build schools and classrooms that they should bear in mind the school population will continue to jump year by year for many years. The 1950 public elementary and secondary school enrollment was over 25 million. The estimated enrollment five years from now is expected to be at least 37 and one-half million, or probably nearer 40 million pupils.

The national shortage is actually concentrated within a few states. Twenty-seven states have two states with one-third

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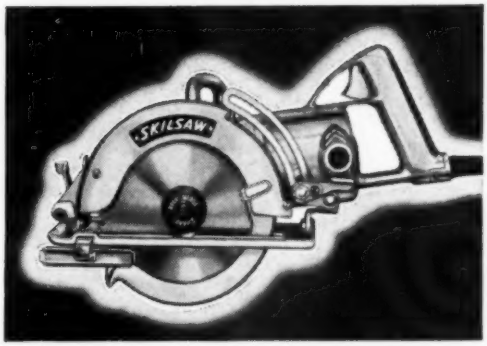

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of the shortage, and five states have over one-half of the total shortage. These states are those which have had the largest and most rapid growth in recent years.

It is extremely interesting to find within the states, most of the shortage is concentrated within a small part of the districts—the districts which have had large, amazing growth. In one state, for example, almost one-third of the classroom shortage is in one county. In another state nine counties out of 67 account for 65% of the total shortage. In still another, half of the shortage is in two counties.

In metropolitan areas the critical shortages appear in what the students of the situation call the fringe, or the suburban areas. The population movement, which affects schools, comes from out of the center of the cities. With the increase and improvement in transportation facilities people in every bracket seek areas where there is more room, more air.

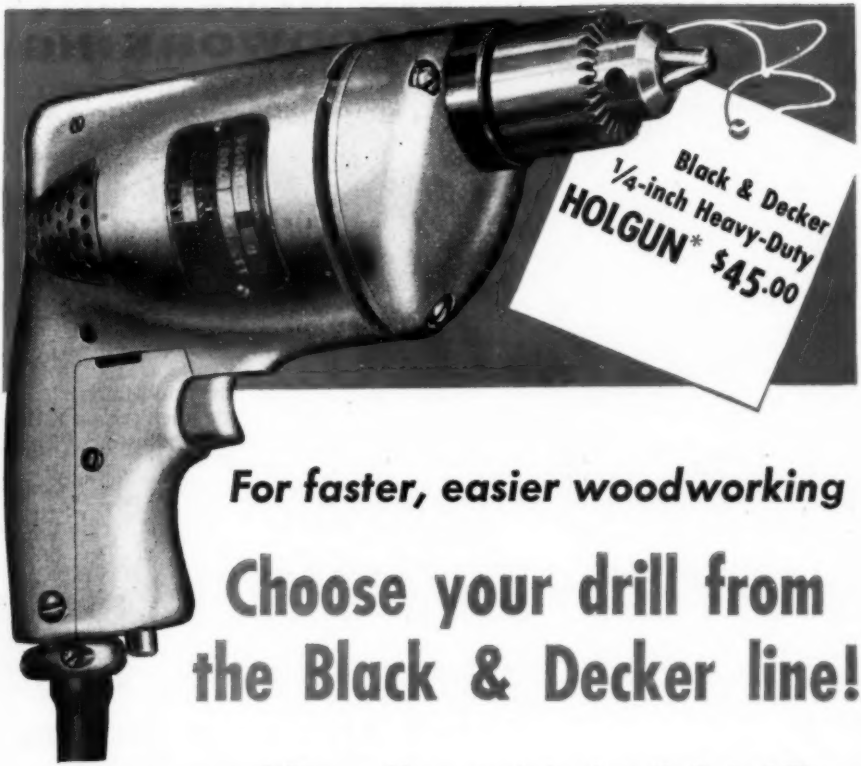
Houses, and groups of houses, and organized subdivisions of houses, have been filling into areas ringing the central cities. These are more than suburbs. They are metropolitan rings criss-crossed by many local governmental and tax jurisdictions, not all of which have been able to provide adequate facilities.

Problems of schools and allied community facilities have been concentrated in a very large measure in these rings. Nearly 50% of the entire population increase, between 1940 and 1950, was in the area around the central cities, and the trend is towards further accelerated growth.

In the central parts of the cities, the population growth, during the ten-year period, from 1940 to 1950, was 14%—in line with that of the nation as a whole—but in the suburban areas around these cities the population increased 35%. Nearly half the entire population increase between 1940 and 1950 was in these outer areas. And this trend is markedly continued.

Present school room construction will provide little more than the number required for increased enrollment and very little required for annual replacement. As has been heretofore stated, at least 300,000 classrooms are needed to eliminate over-crowded, unsafe, unhealthful classrooms. The situation has produced another development that those interested should understand. To expand school construction, four states have formed State School Building Agencies. These Agencies are designed to borrow funds advantageously, since they represent the combined credit of many communities. The local community obtaining the school from the agency gains the use of an urgently needed new structure, which it otherwise could not have. It is the intent of the Federal Government to encourage and sponsor the establishment of these building agencies in all the states so they will share equally in establishing an initial reserve fund equal to one-year's debt service for the obligations of such school agencies. The Federal share of the initial reserve required is estimated at the beginning as $150 million.

Congressman Wint Smith of Kansas has pointed out that these State School Building Agencies, as a qualification for one type of aid, will give the U. S. Commissioner of Education complete administrative control over these building programs. It is sug-



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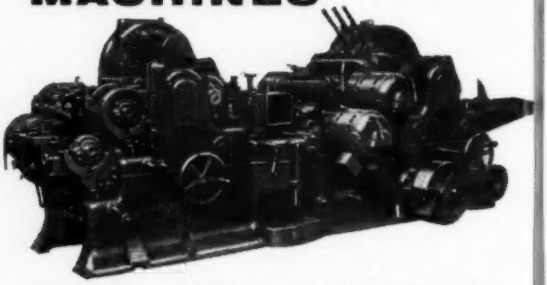

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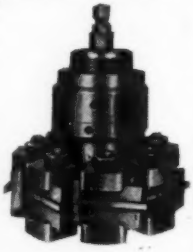

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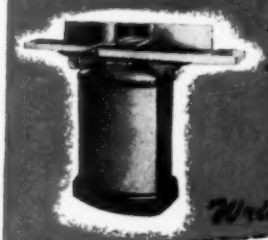

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gested the various tightening mechanisms of the Federal law will give him almost complete control over the nation's teachers, over the textbooks, over the PTAs and other parts that make up the totality of the machinery of the school.

It is expected the creation of these agencies will make necessary that more than 40 states must pass new enabling legislation. Under this program the states may borrow construction money at 3⅛%. Congressman Smith says that many have pointed out that money can be obtained at less than 3⅛% from private sources for school bonds.

The four states which already have State School Building Agencies are: Georgia, Pennsylvania, Maine and Indiana.

Classrooms are immediately needed especially by New York to the extent of 5,000; Pennsylvania, 6,000; Illinois, 3,000; Michigan, 2,500; Georgia, 2,000; Louisiana, 2,250; South Carolina, 2,300; Texas, 5,000; California, 7,000, and Colorado and Washington, 1,000 each.

The distribution of contracts for services and supplies will begin with the State School Building Agencies each one of which will have its own staff, particularly architects. However, the detailed business of planning the procurement of materials and services and making contracts is expected to be vested in the school districts. These districts, with individual school boards, will employ their own architects and other technical and skilled help, to prepare the plans and to consult with the suppliers of the materials and services in the larger cities. These suppliers, in turn, are expected to keep the contractors and dealers, in the immediate area, fully informed in regard to the details as they develop.

Washington has recently had a sequence of interesting visitors from Iceland. The Icelanders, some eight or ten different groups, were all skilled workers who had been trained in their own country mainly by the Americans who came with World War II. These groups included woodworkers and other specialists in similar work. They were brought to this country early in the year for further training. The Foreign Operations Administration deemed the training was necessary because all Americans upon whom they had depended had left Iceland. The Icelanders were taken on a three month tour of the United States. Most of them were taken on visits to Kansas City, Minneapolis, St. Paul and Milwaukee. It is not generally known that the three last-named communities have a relatively large group of families which originally stemmed from Iceland. Many have been here for several generations.

All of these visitors are returning to their homes about the middle of April. They are expected to conduct their specialties after the American pattern, and to train others in Iceland. It is interesting to know that the FOA was rather hurried into the action by the fact that the Russians sent various groups of skilled workers to Iceland to fill the gap left by the Americans. However, the Russian skills did not compare with the American.

Further hearings on the highly controversial tariff question are being held March 22. It is naturally hoped the Senate may undo that which was done by the House, especially by the

vote of 20 to 5 in the House Ways and Means Committee. It is curious that a number of members who voted for the Reciprocal Trade Program now feel very doubtful about the wisdom of their action. It is also curious that the CIO has developed a new proposal which has rather jolted the Congress as well as the White House. It suggests that Government should grant financial aid, under the circumstances, to United States industries, workers and communities. This is the first time that anyone has urged that tax dollars be used for the relief of the communities where the imports of cheap foreign goods would close up a factory.

Congressman Wint Smith suggests: "There could be no limit to spending tax dollars for such a program—when you use direct aid to pay workers, employers and whole communities for loss of business. Many of those who believe in our program of Reciprocal Trade point out that we are so efficient in the the manufacture of machines—that we can compete in the world market. The tragic fact is, however, that we gave billions abroad to build up their economy—they've built and sold automatic machines to the world market—and in turn 'these Marshall Plan economy machines' cover us up with cheap goods to the tragedy of American workers. Most Americans believe we lead the world in the ability to make and sell automobiles. In 1955 the restricted quota of American and Canadian cars that can be sold in Britain is 655. In 1953, 27,121 British cars were imported and sold in the United States. In 1954 the number was 34,545. And the British have no import quotas on automobiles that can come in from France, Italy or Germany."

The whole tariff situation apparently will cause a tremendous fight in the Senate. All amendments were choked off by rule in the house. But they cannot be choked off in the Senate and therefore the fight will be on a number of amendments which will be offered to cut down rather than expand trade.

A Morgantown West Virginia glass-making firm has sued in the Federal Court challenging the validity of the Trade Agreements Act and the Geneva Agreement. The Morgantown Glassware Guild, Inc., contends that Acts are Unconstitutional, that Congress illegally delegated exclusive Congressional powers to the President. The plea points out that the President lowered the tariff rates illegally. The Morgantown firm says what has been done deprives it of its property rights without due process of law as guaranteed by the Constitution. It says it has been obliged to cut its personnel in half and that its business has been reduced one-third. It points out it pays its workers an average of $1.72 an hour while European and Japanese glass makers are paid from one-eighth to one-third of that amount.

Attorney for the hardwood plywood industry supplies the following annual figures: Total imports for 1954, 434.5 million sq. ft.; total domestic production, 715.4 million sq. ft.; imports represented 37.8% of the total market for 1954; dollar value of imports, $32.9 million; average declared value per thousand sq. ft., $75.90.

U. S. Department of Commerce officially reports the United Kingdom export trade reached an all-time high in 1954 with the upturn in exports to the United States.

Off the drawing board

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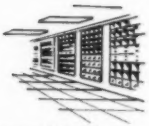

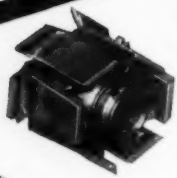

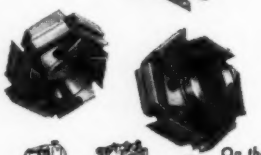

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SOUTHERN PINE Meets in New Orleans

BY official proclamation April 3-10 will be Southern Pine Week in New Orleans, and a fine turnout is expected for one of the most significant meetings in the association's 40-year history. The Southern Pine Association convention will be held April 4-6.

Quality improvement and cost reduction are the convention themes, and developments along these lines, present and potential, will be thoroughly aired. A mammoth logging and sawmill machinery exposition will be held concurrently, and this is attracting wide attention among all segments of the wood producing and woodworking industries. Scene of the convention and exposition will be New Orleans' huge Municipal Auditorium.

The logging and sawmill machinery exposition is the third such affair to be sponsored by the association, and this year's show should be the most important of them all. A complete sell out of exhibit space seems to be assured, and wider participation is expected than in the last exposition a couple of years ago, when exhibitors sold machinery valued at more than $1,000,000 on the floor alone.

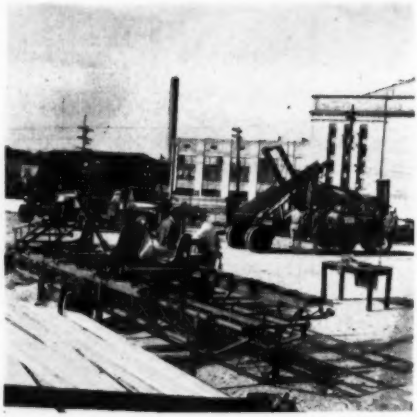
Not only will the best and most modern tools available to the sawmill industry be on display, but also late model machinery for all the other wood industries. There will be items of interest for the pulp and paper industry, woodworking, wood processing and treating firms, laminated wood producing companies and many others. Where ever possible, there will be action demonstrations, and materials such as glues, chemicals, and petroleum will be on display, as well as the machinery.

Equipment used for modern forest management programs, debarkers and safety equipment are only a few of the categories of items. Demonstrations, such as more efficient transportation and loading techniques, will emphasize the "quality improvement and cost reduction" themes.

S. P. Deas, secretary-manager of the Southern Pine Association, said the exposition will cover nearly every process that is applied to the tree from the time it is planted until the wood is in the hands of ultimate consumers.

As for the convention itself, Deas said there was every indication of a

Visitors to the show will be permitted to operate some of the machinery themselves.



The newest in sawmilling and logging equipment will be on display.

streamlined agenda with panels of experts conducting sessions on vital issues.

These business sessions will be conducted at the Auditorium for the convenience of delegates. These will be limited to one hour each and there will be only two a day—one in the morning, the other in the afternoon. The short sessions will give delegates ample opportunity to watch the numerous demonstrations the exposition will offer.

PROGRAM AND EVENTS

The convention program will largely be devoted to streamlined panel sessions conducted by experts in various fields.

Monday, April 4

Morning

Delivery of the annual report by President G.R. Swift of the Southern Pine Association. Keynote address by Robert Burkhardt.

Afternoon

Forestry and logging panel. Participants include: A. P. Downing, T. R. Miller Mill Co., Brewton, Alabama; J. E. Caffrey, vice-president, International Paper Co., Mobile, Ala.; M. C. Leech, the Alger-Sullivan Lbr. Co., Century, Fla.; and George Stanley, Kirby Lumber Corp., Houston, Texas.

Tuesday, April 5

Morning

Panel on sawmilling. Participants include: J. R. Bemis, Ozan Lumber Co., Prescott, Arkansas; Joe Clarkson, Dierks Forests, Inc., DeQueen, Ark.; Tom DeWeese, A. DeWeese Lbr. Co., Philadelphia, Miss.; and Ross Cahal, assistant mgr., Southern Pine Inspection Bureau.

Annual Meeting of Southern Pine Inspection Bureau.

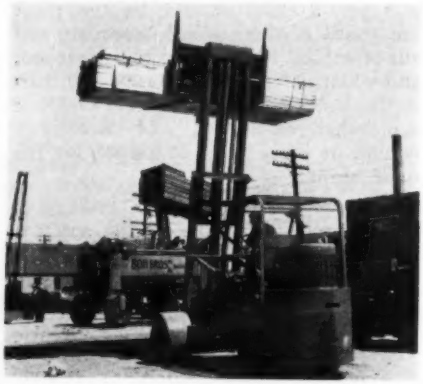
Afternoon

Panel on planing and drying. Participants include: J. E. Ives, Bradley Lumber Co. of Arkansas, Warren, Ark.; W. A. Belcher, W. A. Belcher Lumber Co., Birmingham, Alabama; Raymond C. Rietz, Chief, Division of Timber Physics, U. S. Forest Products Laboratory, Madison, Wis.; and Hobart L. Manley, Reynolds & Manley Lbr. Co., Savannah, Ga.

Wednesday, April 6

Morning

Panel on research and marketing. Participants include: Earl McGowin, W. T. Smith Lumber Co., Chapman, Alabama; Latané Temple, Southern Pine Lumber Co., Diboll, Texas;



Materials handling equipment will be in operation in the outside area.

Exhibit booth arrangement at the Municipal Auditorium.

Carl Rishell, Director of Research, Lumber and Wood Products Laboratory, Timber Engineering Co., Washington, D. C.; and Charles R. Colbert, New Orleans architect and nationally known authority on school construction.

Afternoon

Mass meeting of Southern Pine manufacturers with the Southern Pine Industry Committee to discuss legislative and other industry-wide problems. Particular emphasis will be focused on impending minimum wage legislation. Committee Chairman E. O. Lightsey, Miley, S. C., will preside.

All panels will be confined to one hour duration, so that delegates will have ample opportunity to take in the exposition demonstrations. Question and answer periods will be provided, and questions remaining after the one hour limit will be attended to later through the mails.

MACHINERY DISPLAY

This year's machinery exposition is attracting wider interest even than the last such show two years ago, when more than a million dollars worth of equipment and supplies were sold on the floor alone. It is highly significant that many of the demonstrations have been designed to promote the mutual interests of the lumber and pulp and paper industries in forestry and other fields.

All kinds of equipment that makes for more efficient performance in these industries and in other woodworking, producing and treating industries will be on display. Special emphasis will be placed on the machinery used in improved forestry programs, in safety programs, and for more efficient materials handling. Wherever possible, action demonstrations will be the rule. Chemicals, fuels and other supplies will be on hand, along with the machinery.

The annual president's reception will be given on the evening of the convention's second day, Tuesday, April 5. While the main program will take place at Municipal Auditorium, executive sessions of SPA's board of directors and committees will be conducted at the Roosevelt Hotel. Tours and other events have been arranged for the ladies.

Exhibitors and Displays

A list of exhibitors includes the following firms.

Acme Steel Company
2840 Archer Ave.
Chicago, Illinois
Booth: No. 300-300-A-400
Equipment: Steel strapping; strapping tools & equipment.

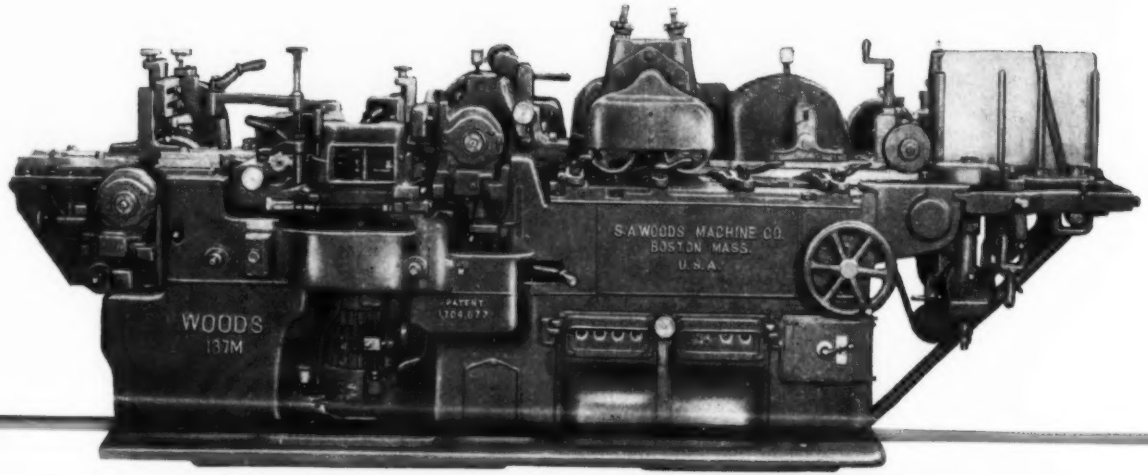
Ajax Machine Works
New Orleans, Louisiana
Booths: No. 3-4, outside.
Equipment: Yale fork lift truck; M. B. clamp.

Serving the Industry Since 1852

It's Marvelous!

This "LAG BED" MOULDER

built by "The Moulder of Woods" ®



134 Woods Moulder, shown

134 Woods Moulder, shown with hopper feeding attachment

Production depends on DESIGN!

From the forest to the finished product, *Leaders in the Industry* depend upon Woods "Lag Bed" Moulders for quantity and quality production. Among such Leaders are—

EMPIRE MILLWORK CORP.
Corona, N. Y.

D. L. FAIR LUMBER CO.
Louisville, Miss.

MADERA LUMBER CO.
El Paso, Texas

NATIONAL CASKET CO.
Nashville, Tenn.

LONG-BELL LUMBER CO.
Longview, Wash.

RED LION FURNITURE CO.
Red Lion, Pa.

SOUTHERN MILL & MFG. CO.
Tulsa, Okla.

WEYERHAEUSER TIMBER CO.
Springfield, Oregon

S. A. WOODS MACHINE CO.

27 DAMRELL STREET

BOSTON 27, MASS.

Branch Offices: ARK., Little Rock CALIF., San Mateo N.Y., Mount Vernon
ORE., Portland TENN., Memphis VA., Richmond
Canadian: B.C., Vancouver, Akhurst Mchy. Co. ONT., Galt, Canada Mchy. Co.
Export Dept. United States Machinery Co., 90 Broad St., New York City

G. R. Swift, president, Southern Pine Association.

Allis-Chalmers
Milwaukee 1, Wisconsin.
Booths: No. 609-612 (outside); Booth No. 17 (Inside).
Equipment: Crawler tractor with dozer, winch, cable & chokers; grader with loader & scarifier; wheel tractor with backhoe; etc.

American Logging Tool Corp.
St. Louis 15, Missouri
Booth: No. 107
Equipment: peavies; cant hooks; Hi-Jacks; tongs & other logging tools; some items of wire rope.

American Pulpwood Association
Sylacauga, Alabama
Booths: No. 101-102

Armstrong Manufacturing Co.
Portland, Oregon
Booths: No. 225-325
Equipment: saw sharpeners & tools.

Joe H. Brady & Associates
Birmingham, Alabama
Booths: No. 415-416-515-516
(Representing: Timberland Saw Co.; Carolina Chain Saw Co.; McCulloch Motors Corporation.)

Branyan & Peterson, Inc.
Memphis, Tennessee
Booths: No. 213-214
Equipment: McDonough 54" band resaw; new layout for gang saw mills.

Calvert Machine Service
Boring, Oregon

Caterpillar Tractor Company
Peoria, Illinois
Booth: (not assigned)
Equipment: D4 tractor; D6 tractor; Cat No. 6 Traxcavator equipped with logging fork & new Cat D339 Diesel engine.

Chain Belt Company
Milwaukee 1, Wisconsin
Booth: No. 406
Equipment: complete line of steel & cast chains; drive & conveyor chains; sprockets; flexible couplings; etc.

Chapman Chemical Company
Memphis, Tennessee
Booth: No. 510
Equipment: Display showing uses of chemicals by the sawmill industry.

Clark Equipment Company
Battle Creek, Michigan
Booth: No. 14 (outside)
Equipment: lift trucks; saddle carriers.

Corley Manufacturing Company
Chattanooga, Tennessee
Booths: No. 215-218 & 315-318.
Equipment: sawmill carriage with electric setworks; multi-saw gang edger West Coast style; hydraulic log turner.

DeWalt, Inc.
Lancaster, Pennsylvania
Booths: No. 523-524
Equipment: radial arm woodworking machinery, models GE with safety power rip feed, GA, GWI, and MBC.

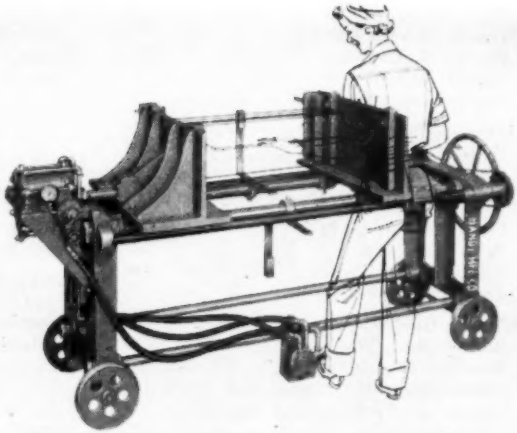
Henry Disston & Sons
Philadelphia, 35, Pennsylvania
Booth: No. 525
Equipment: machine knives; circular & band saws; cutter heads; files.

Dixie Bearing Company
New Orleans, Louisiana

Electric Lighting Sales, Inc.
Stockton, California
Booths: No. 421-422
Equipment: lumber grading lighting.

Do you make every drawer 3 times?

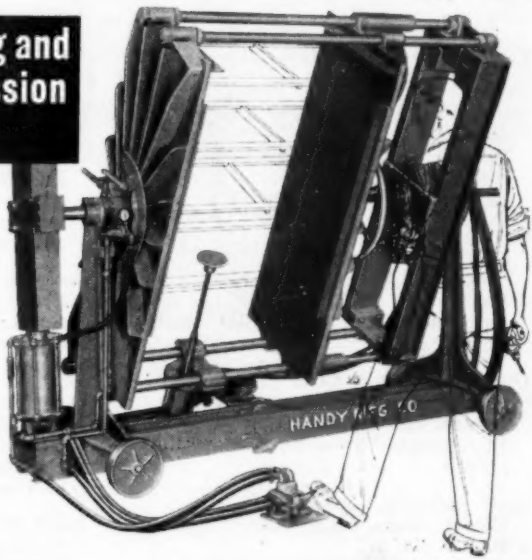
Do you bench pre-assemble, then squeeze in a clamp, then do a lot of costly drawer fitting? Now, the *No. 43A Handy Air-powered Drawer Clamp* makes it easy and fast to turn out accurate, square drawers without pre-assembly, and fitting is reduced to a minimum. After quick set-up, the operator simply places the drawer parts in the Clamp, and, in a single or dual operation, makes you better drawers. Down go costs on any quantity.



In your Cabinet Room

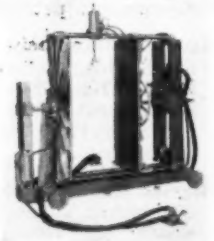
New Power Steering and Automatic Transmission put you out front

In your new car power-aids are pure pleasure; in cabinet and case assembly this engineered power yields dollar profits. Power revolving, power clamping go to work for you with the new *No. 410 Series Handy Case Clamps.* Optional power top-pressure, too, with exclusive Handy Hollow-bore cylinders doing the work fast and true. Your cabinet makers always have full control of clamping speed and pressure and revolving. To men responsible for production and lower, competitive costs, Handy Full-powered Case Clamps are today's buy that pays.



handy MANUFACTURING COMPANY ESTABLISHED 1903

This is worth checking into right now. Write, wire or phone.



HANDY Manufacturing Company

2436 West Lawrence Avenue • Chicago 25, U.S.A.

Electric Steel Foundry
Portland, Oregon
Booth: No. 108
Equipment: Logging equipment.

Electronic Heating Corp.
Newton Highlands, Mass.
Booth: No. 404

Enterprise Company
Columbiana, Ohio
Booth: No. 500
Equipment: Crescent 36" band saw; Crescent P-24 planer.

Filer & Stowell Company
Milwaukee, Wisconsin
Booths: No. 401-402
Equipment: air motor set works in operation with an air dog knee.

Ford Motor Company
Gretna, Louisiana

Forestry Suppliers, Inc.
Jackson, Mississippi

General Electric Company, Electronics Division
New Orleans, Louisiana
Booth: No. 311
Equipment: two-way radio.

Gerrard Steel (U.S.S.C.)
2915 W. Forty-Seventh
Chicago, Illinois
Booth: No. 118
Equipment: round and flat steel strapping.

Greenlee Bros. & Co.
Rockford, Illinois
Booths: No. 321-323
Equipment: literature and photographs.

Gulf Refining Company
New Orleans, Louisiana
Booth: No. 511
Equipment: petroleum products.

Hanchett Manufacturing Co.
Big Rapids, Michigan.
Booths: No. 408-409-410
Equipment: automatic knife grinding machinery; automatic saw sharpening machinery.

Haynes Manufacturing Company
Livingston, Texas
Booth: No. 324
Equipment: tree girdler; brush & pruning saws; post hole auger; wood stump auger.

Homelite Corporation
Port Chester, New York

Hughes-Keenan Corporation
Delaware, Ohio
Booth: outside exhibit
Equipment: motive crane with a special log & pulp wood handling boom.

Hyster Company
Danville, Illinois
Booths: No. 411-412 (Inside); No. 16 (Outside).
Equipment: QN-20 lift truck; YT-40 lift truck; pulpwood loader; XA-60 lift truck; YC-40 lift truck; straddle truck.

Independence Machine Corporation
Independence, Iowa
Booth: No. 16 (outside).
Equipment: circular lumber mills.

Irvington Machine Company
Portland, Oregon
Booths: No. 201-202-302
Equipment: cutoff saws; smooth-end trimmers and surfacers; operating model of the end surfacer equipped with an end printing machine.

Jackson Lumber Harvester Co.
Brewton, Alabama
Booth: No. 203
Equipment: scale model of portable sawmill.

Curt G. Joa Company
Sheboygan Falls, Wisconsin
Booth: number not available
Equipment: the Joa model 1500 Bond-O-Therm electronic gluer.

Kent Machine Company
Cuyahoga Falls, Ohio
Booth: No. 505
Equipment: set works and various size dogs.

McConnell Bros. Tool & Machine
Italy, Texas
Booth: No. 403
Equipment: Henry Maxicut saw.

Mall Tool Company
7740 South Chicago Ave.
Chicago 19, Illinois

combination trim-piece and chair-back fastener

simplifies K-D shipment

- **CUTS SHIPPING COSTS**
- **CUTS STORAGE COSTS**
- **CONCEALS RAGGED EDGES AT ENTRY POINT**
- **AVAILABLE TO FIT SIX STANDARD TUBE SIZES**
- **PLATED OR BLACK FINISHES AVAILABLE**

Trim-piece is simply placed over hole drilled in chair-back structure and fastened with wood screws or upholstery nails. Chair-back can then be pushed onto tubular metal supports to complete chair assembly in store or home. Fastener's teeth bite into tube walls and hold securely.

UNITED-CARR FASTENER CORP.

31 [illegible] Street, Cambridge 42, Mass.

MAKERS OF DOT FASTENERS

DISTRICT OFFICES: NEW YORK—15 East 26th Street • CHICAGO—35 East [illegible] Street • CLEVELAND—1468 West 9th Street
SYRACUSE—2343 Salisbury Avenue • DETROIT—2020 East Grand Boulevard • LOS ANGELES—1709 West Eighth Street

Booths: No. 325A (inside, No. 425 outside.)
Equipment: 'MG' chain saw line; generators; pumps, and portable power tools.

Mann-Russell Electronics
Tacoma 1, Washington
Booth: No. 407
Equipment: blown-up photographs of several different equipment applications, and a large view of Model 200 R. F. generator; also continuous lumber edge gluer.

Mattison-Greenlee Service Corporation
(See also: Greenlee Bros. & Co.; Mattison Machine Works.)

Mattison Machine Works
Rockford, Ill.
Booths: No. 321-322-323
Equipment: literature and photographs

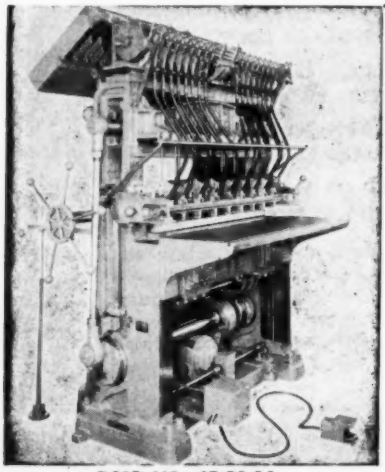
Mill Engineering Company
Seattle, Washington

Moisture Register Company
Alhambra, California
Booth: No. 320
Equipment: complete line of lumber moisture testers.

B. L. Montague Company, Inc.
Sumter, South Carolina
Booths: No. 204-205
Equipment: Armstrong sash gang saw grinders; slot roll sorter.

Moore Dry Kiln Company
Jacksonville 1, Florida
Booths: No. 112-113-114
Equipment: operating model of a double-track Moore cross-circulation kiln; Moore 60" diameter dry kiln fan; etc. A setup of the Kil-Mo-Trol, —system for measuring the moisture content of lumber in different parts of the kiln charge.

Newman Machine Company, Inc.
Greensboro, North Carolina
Booths: No. 208-209-308-310
Equipment: planer and matcher; G-16 pedestal type head grinder; G-71 bench type head grinder; G-132 automatic knife grinder; G-232 hydraulic knife grinder; S-620 single surfacer;



DOIG NO. 45-20-16

THOUSANDS OF PROBLEMS HAVE BEEN SOLVED BY

DOIG AUTOMATIC NAILERS

Standard Doig Features

1. Anti-friction bearings.
2. Three separate motorized drives.
3. Nail feeder to handle nails from 1 to 3 inches without additional parts required.
4. Nail feeders to give 12 separate nailing combinations.

NEW FEATURES

A. Wheel on left allows operator to adjust back gage from operating position.
B. Solenoid trip permits operator to trip machine at any position desired.

WRITE TODAY. WE INVITE YOUR REQUESTS FOR FULL DETAILS

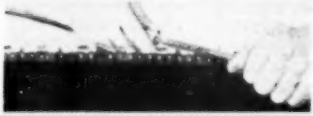
WILLIAM S. DOIG Inc.

DEPT. 312 — 894 MANHATTAN AVE., BROOKLYN 22, NEW YORK

The Right

SPECIAL GULLET FILE

Type File

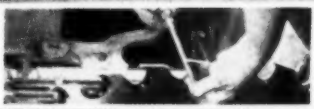


CHAIN SAW FILE

Does it Better

CANT SAW FILE

– a "Red Tang"



SPECIAL SAW BIT FILE (Two Round Edges)

Does it Best!

MILL FILE (Two Round Edges)

SIMONDS
"Red Tang"
SAW FILES
SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASS.

One quick comparison and you'll know the difference in Simonds "Red Tang" Saw Files. You'll feel it in the faster, easier filing . . . see it in the smoother, sharper results you get . . . benefit by the extra service you get from every file. Any experienced saw filer will tell you Simonds makes only the best — Grade A . . . in types and sizes for every circular, band or chain saw sharpening need.

For Fast Service from Complete Stocks

Call your **SIMONDS Industrial Supply DISTRIBUTOR**

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon. Canadian Factory in Montreal, Que. Simonds Divisions: Simonds Steel Mill, Lockport, N. Y. Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

S-824 single surfacer; SW-830 single surfacer; T-20 hollow chisel mortiser; K-16 tilting arbor variety saw.

Onsrud Machine Works, Inc.
3900-32 West Palmer St.
Chicago 47, Illinois
Booths: No. 604-605
Equipment: lumber stretcher (scarfing machine)

Oregon Chain Saw Corporation
Portland 2, Oregon
Booth: No. 206
Equipment: chains and accessories (for use on chain saws).

Pettibone-Mulliken Corporation
4700 W. Division Street
Chicago, Illinois
Booth: number unassigned
Equipment: Cary-lift

Prescott Company
Menominee, Michigan

Rees Blow Pipe Company
Berkeley 10, California
Booth: No. 413
Equipment: model of a sawmill refuse burner

Sherman Products, Inc.
Royal Oak, Michigan
Booths: No. 220-222
Equipment: Sherman fork lift for tractors.

Signode Steel Strapping Co.
2600 N. Western Avenue
Chicago, Illinois
Booths: No. 417-418
Equipment: power strapping of bundled flooring.

Simonds Saw & Steel Company
Fitchburg, Massachusetts
Booth: No. 116
Equipment: wide band and band resaws; solid inserted tooth and carbide tipped saws; saw sharpening files and planer; hog and chipper knives.

Soderhamn Machine Mfg. Company
Talladega, Alabama

Stetson-Ross Machine Company
Seattle, Washington

Burning WOOD SCRAP instead of COAL

saves this luggage manufacturer $6,000 annually on fuel bill

. . . . with help of

AMERICAN WOOD HOG

"We have fed as high as 3,000 lbs. of wood scrap per hour to this hog," writes this well-known luggage maker. "Since the installation of our wood-burning equipment *we have not purchased a single ton of coal* for boiler use! And the result in savings has amounted in excess of $6,000 annually."

WRITE for new WOOD HOG BULLETIN

American PULVERIZER COMPANY

1510 MACKLIND AVE. • ST. LOUIS 10, MO.

Strunk Equipment Company
Coatesville, Pennsylvania

Taylor Machine Works
Louisville, Mississippi
Booth: not assigned
Equipment: Y-16000 lift truck.

Tri-State Machinery Company
Dallas, Texas
Booths: No. 123-124-125
Equipment: finger jointing and gluing machinery.

R. T. Vanderbilt Company
230 Park Avenue
New York 17, N. Y.
Booths: No. 107-108
Equipment: exhibit chemicals useful as sap stain and mold controls, end-sealers, seasoning agents and wood preservatives.

Wapakoneta Machine Company
Wapakoneta, Ohio

Wheland Company
Chattanooga 2, Tennessee
Booths: No. 312-313-314
Equipment: electrical shift two saw trimmers; continuous running movie.

Wood-Treating Chemicals Company
St. Louis 10, Missouri
Booth: No. 100
Equipment: sawmill waste utilization equipment including sawlog debarkers and chippers, etc.

Wright Power Saw Company
Sheboygan, Wisconsin
Booth: No. 512
Equipment: GS-218 gasoline saw; AS-221 pneumatic saw; AO-8 air line oiler.

"ABOUT WHEELS AND PROGRESS"

A new brochure, entitled "About Wheels and Progress" has been released by Nutting Truck and Caster Company, Faribault, Minnesota.

Illustrated in two colors, this 20-page brochure gives a brief history of the company from its founding to the present. Included in the history is the interesting story of the development of the truck that would "turn on a dime" plus an account of the company's growth and its present day facilities to supply floor trucks, casters and wheels. Adhering to a "what's what" pattern instead of the conventional and trite "who's who," it is liberally sprinkled with photos of manufacturing, warehousing and shipping operations plus others of office and engineering facilities.

SAFETY EQUIPMENT

A new general catalog on industrial safety equipment is available from Willson Products, Inc., Reading, Pa. This new, easy-to-read, fully illustrated catalog is designed as a workable, everyday safety manual.

The catalog is divided into four major sections—eye protection, head protection, respiratory protection, and welding. Illustrations, descriptions, and ordering information have been correlated for simplicity and practicability.

Hug—Energy going to waist.

HARTFORD CLAMPS
Since 1915

Single Bar Clamps

Style No. 16, adjustable head piece only

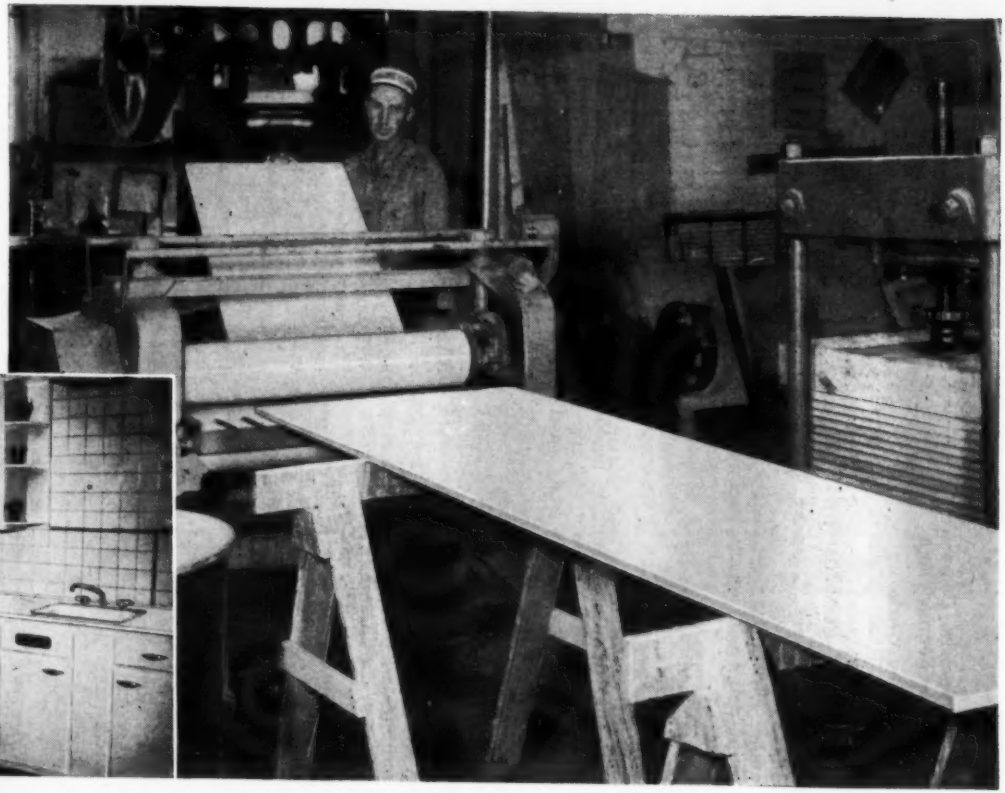
Style No. 17, adjustable tail piece only

Quick adjusting, self-locking and unlocking . . . both styles tested for safe clamping strain of 1800 lbs.

HARTFORD CLAMP COMPANY • EAST HARTFORD, CONN.

LAMINATING with KWIK-KLAMP

The Sanderson-Harold Co. Ltd., Paris, Ontario, uses National's KWIK-KLAMP in laminating plastic sink and table tops and in fabricating a variety of kitchen furnishings. Photo at right shows plastic sheeting on a glued-off sink top core ready for pressing.



SIMPLIFIES STACK HANDLING

ready-for-use resin gives machining bonds in 1 hour

SIMPLIFIES STACK HANDLING

ready-for-use resin gives machining bonds in 1 hour

KWIK-KLAMP is used to bond screen-backed hardboard to cabinet door frames. Several stacks are cycled in the press. Clamping time is as low as 20-30 minutes per stack.

KWIK-KLAMP securely laminates plastic to wood (or wood to wood) in as little as 20-30 minutes—reaches machining strengths in only an hour. Presses can be emptied in time for reloading without bar clamping and the handling of heavy clamped up stacks. Curing rooms and the messiness of glue mixing and heating are eliminated.

KWIK-KLAMP is used directly from the drum. The process is simple *and continuous*. Using a press such as that pictured, all you do is glue off cores and cover them with plastic and backup sheets, building a stack to pressload height and inserting the load in the press. Then you build and press two more stacks in other sections of the press. By this time (an hour or less) the first stack can be removed, ready for machining. Replace it with a new stack and continue the cycle in the press, building a new stack and removing an old one every 20-30 minutes.

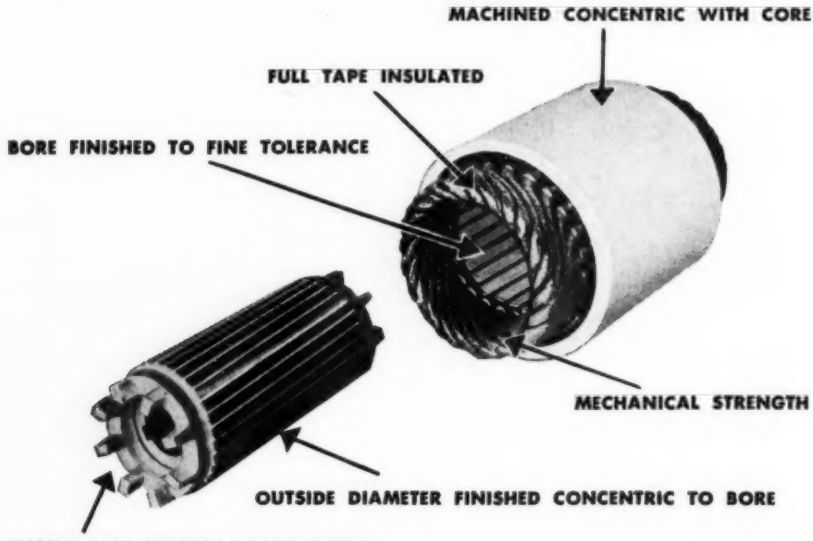
RESYNS®
National
ADHESIVES

SPECIAL OFFER! See for yourself how the KWIK-KLAMP process works. Write for 5 gallons of KWIK-KLAMP—*on a trial and approval basis.*

NATIONAL ADHESIVES. Woodworking Department WWD (Resin Division), 270 Madison Ave., New York 16. 3641 So. Washtenaw Ave., Chicago 32. 735 Battery St., San Francisco 11. 1511-23 So. Main St., High Point, N. C.

Serving the Industry Since 1852

WOODS SHAFTLESS MOTORS


MACHINED CONCENTRIC WITH CORE
FULL TAPE INSULATED
BORE FINISHED TO FINE TOLERANCE
MECHANICAL STRENGTH
OUTSIDE DIAMETER FINISHED CONCENTRIC TO BORE
VANES CAST INTEGRAL WITH ROTOR

The application of direct motor drive with WOODS' Shaftless Motors to high-speed spindles brings the peak of motive efficiency at relatively small cost. Conserves space—eliminates belts and gears—fewer wearing parts. The extensive and varied lines of WOODS' Shaftless Motors are available for nearly every class of direct application.

Let us tell you how you can achieve a reduction in production costs by direct motor drive.

MOTOR DIVISION

S. A. WOODS MACHINE CO.
27 DAMRELL STREET
BOSTON 27, MASS.

CHIPCORE

The Designer Uses It

By Henry P. Glass, IDI

Glass-Huebner Associates

OUT of the lowly waste of the lumber yards, human ingenuity has created a panel material which is already employed in many articles surrounding us and which I dare predict will soon do a greater part of the job of actually surrounding us. This statement is meant to be understood verbally, concretely, and three-dimensionally. Chipcore products are not only capable, but in various forms ideally suited, to form floors, walls and ceilings of human habitations. They can serve wherever flat panels of dimensional stability are required.

Vertical process chipcore is versatile in application and easy to work. It is, in fact, the adaptability of chipcore as a moderate cost core of any desired thickness for multiple-sandwich construction with face layers of many possible descriptions answering many purposes which makes this material almost universally applicable.

One of the most obvious and already widely accepted and proved applications of chipcore is its use as core material for all kinds of furniture, built-in as well as movable. Typical sections containing chipboard as core material are countertops, tabletops, all kinds of hinged and sliding doors, shelves, drawer fronts, cabinet tops and sides, etc.

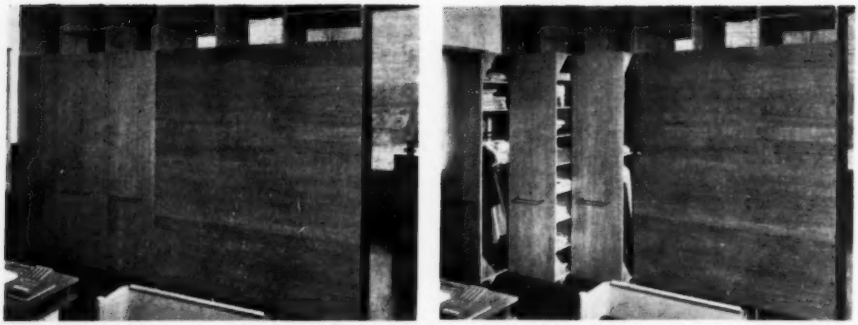
Where a heavy, thick appearance is desired, the tubular form of chipcore is especially desirable, as it gives thickness without awkward weight. Solid chipcore is similar to lumber core in weight.

Chipcore plywood panels of ¾" offer equal vibration strength at less expense than ¾" lumber core plywood. Chipcore has good screw-holding properties and also takes a wide variety of special edge-banding treatments.

Because of chipcore plywood's light weight, stability, sturdiness and low cost, I have specified it for a line of school furniture I recently designed and which will be introduced soon.

Because of their strength, the straightness of the panels without framing, the low cost chipcore plywood panels are also particularly adaptable for built-in furniture and storage units of various types. For my own home I have recently designed and built a "home filing system" with chipcore panels faced with mahogany veneer. These simple shell case units without backs or framing roll out—like "carts" fitted with rods for hanging jackets or blouses, or slide-out tray shelves for shirts, sweaters, etc. Other cart units are tailored to accommodate shoes, handbags, cosmetics and so forth. For use as low room dividers, backs of chipcore plywood could easily be added to the case shells.

Manufacturers of prefabricated storage units would find that using sturdy inexpensive chipcore plywood without framing would simplify construction and lower costs. It would even make it



A built-in divider of mahogany chipcore plywood provides functional storage sections and serves as a room divider between two children's rooms. The edges of the panels are sanded, but not banded and the exposed chipcore edge lends an unusual and attractive decorative touch.

possible to offer built-in furniture in fine veneering at reasonable cost.

Another field in which chipcore offers great possibilities is the building industry where there is a tremendous need for low-cost, easy to fabricate and install materials.

Chipcore plywood panels offer money-saving opportunities as wall panels, interior wall panèling and built-ins and non load-bearing wall partitions. Prefab housing manufacturers are already experimenting with chipcore panels, and as stock chipcore plywood panels become increasingly available at building supply dealers, their use by the average home builder for both conventionally built and panel-type housing can be forseen.

Another version of the home filing system built into a wall in the hall by the garage entrance. Front panels are gum-veneered chipcore, painted to match the wall. The lower section, for rubbers, play shoes, etc., pulls out on castors and forms a bench to sit on for removing rubbers.

As an example of the tremendous money, time and labor saving factor offered by chipcore plywood for building, I recently designed a two-car chipcore garage for the Dean Company. This garage makes use of extra large plywood panels, which are easy to fabricate and exceptionally stable in chipcore plywood. This garage design which Dean will make available to interested manufacturers, uses veneered exterior type chipcore panels for the walls, roof and even the large sliding doors and is so simple to cut and erect it could be called a do-it-yourself project!

For the basement game room I recently designed for a friend's home, I used ¾" chipcore plywood panels faced with primavera for most of the sidewalls, and for the built-in storage and shelves behind the bar which had a plastic-faced chipcore countertop.

View of kitchen showing two built-in ovens and five built-in refrigerator units, with walls and storage of walnut Formica Realwood chipcore plywood.

Matching perforated chipcore plywood panels were used to conceal the four ceiling-high heating and air-conditioning units behind the walls. Used for vertical walls, chipcore up to 4′ x 12′ in size offers many possibilities. In thicknesses of ½″ to ¾″ it makes a fine core for decorative veneer applied to standard stud construction.

With today's great increase in building constructions using non-load bearing interior walls, chipcore has an indisputable future as a leading material for such walls. For both homes, offices, schools and other institutions, and commercial installations. It is readily adaptable for on-site construction or prefabricating of such walls.

The "lighter-than-solid" weight and exceptional thicknesses possible in veneered panels using tubular chipcore, combined with the chipcore's non-warping stability, make it an excellent partition material. Studs, furring strips and other interior framing constructions are eliminated, as is the time and labor factor of attaching panels to both sides of the wall.

This wall system makes use of a simple movable tent-shaped 5″-high lumber baseboard construction that allows for wiring, on which rest the thick tubular chipcore panels faced with veneers on both sides. The chipboard can be for instance, 2″, 3″ or 4″ thick, and panels are 7′5″ high and 4′ wide, with narrower width panels possible for fitting to room sizes. The top molding is grooved on the underside, and the chipcore panels at the top, to accept a narrow hardwood spline which fits the wall rigidly in place. Door framing units would also be prefabricated sections.

Many other simple prefab wall partition systems could be worked out, using thick chipcore panels, with faces of veneer or other desirable surface layers.

Another field where chipcore is just getting started but proving successful is a core material for flush doors, where its rigidity and stability are also important.

The acoustical properties of chipcore plywood, and its low cost and lack of need of framing, are making it one of today's most popular materials for fine television, radio and high-fidelity record-player cabinets. Its excellent

Breakfast room features paneling and built-ins of chipcore veneered with walnut Formica Realwood.

glue-holding properties under temperature extremes, and its stability, are also important in cabinet use.

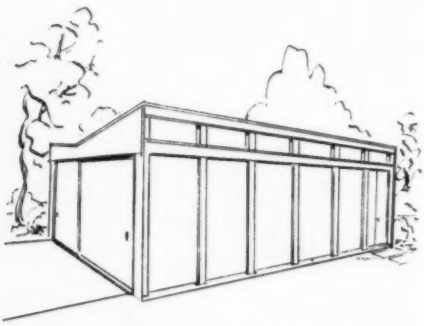
Experimental Uses

Now in the laboratory and testing stage are many other uses for vertical process chipcore. Let us investigate a few of the possible uses:

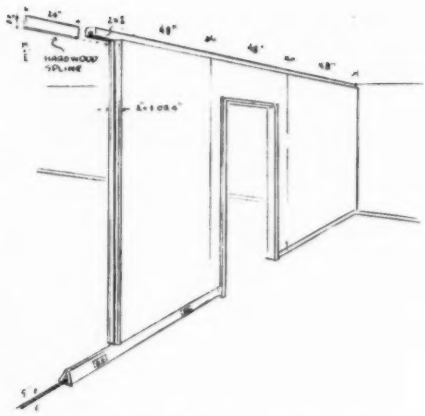
Starting from the bottom, chipcore could be used as a core material for flooring, with face layers of hardwood veneer simulating parquet effects, etc.

Designs have been made and experimental runs produced which are now being tested, and there is every indication that these flooring products will be successful. If so, they could be laid in mastic in large sections up to 4' x 4' over any deck or concrete surface.

Experiments are also being conducted right now in which two or more layers of chipcore are laminated with layers of fibreglass between them and surfaced with asbestos cement on one side and veneer on the other side to form sandwiches 3" and 4" thick. These panels, which are being used and tested in Germany, can be used as self-supporting prefabricated outside wall panels for homes, shops, restaurants, garages, schools, etc.



Sketch by Henry Glass of a prefab or DIY two-car garage made with large chipcore panels. Design made for the Dean Company and available to interested firms.



Sketch made by Glass for a system of non-load-bearing modular wall partitions. Designed for Dean, but available to any firm interested in making them from chipcore.

Raw chipcore without facing of any kind, nailed to two ceiling joists in sections of 2' x 2' or 4' x 4', ½" to ¾" thick is now being tested and promises good possibilities for use as a sound absorbing ceiling material.

In conclusion, speaking as a designer and engineer closely connected with architecture, I believe that chipcore opens new horizons in design treatments and fabricating methods in a number of fields, some as yet probably unforeseen.

FRED BUELTE

Fred Buelte, Sr., president and founder of the Buelte Tool & Engineering Co., Belvidere, Illinois, died recently. Mr. Buelte had long been recognized as a leader in the field because of his many years of pioneering and engineering of carbide tipped tools. A number of his early developments with carbides are now standards in the industry.

The company will continue under the leadership of his son, Fred Buelte, Jr., who has been associated with his father in the firm for some years.

new high-speed router cuts any material smoother, faster!

Porter-Cable's new Model 511 Router has greater *power*, greater *speed*—for up to *36% faster cutting* in wood, plastics, laminates. And its revolutionary Kam-Grip Chuck means bits can't run out—chatter and kick are ended—tools last longer, cuts are smoother. It's a Porter-Cable *quality* tool throughout—priced to make it the *biggest router value ever!* See and try it now—*or write today for the name of your nearest dealer and FREE 48-page Router Manual.*

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PRODUCTION PARAGON

By Thomas A. Dickinson

Founded in 1898 by a European cabinetmaker named Fred Weber with a capital investment of only $28, Weber Showcase and Fixture Company of Los Angeles, today grosses $25,000,000 per year. The company has a production setup which includes some of the most modern and efficient woodworking machinery in the world.

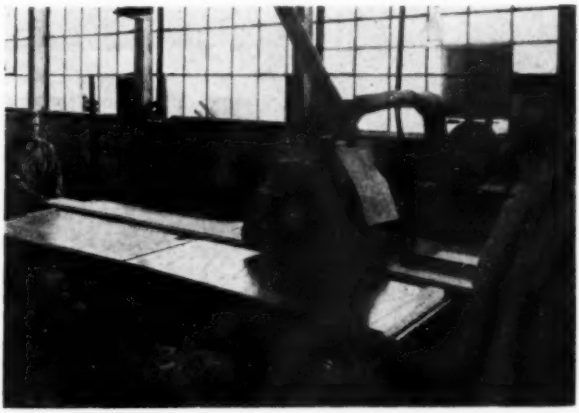
Principal products of the company include wall partitions for office buildings, showcases and related fixtures for retail stores, and laboratory accessories for schools and other institutions. These wood products are manufactured on a 14-acre plantsite by approximately 1600 employees.

Woods processed by Weber include virtually all domestic types of lumber and veneer, plus a variety of rare materials—such as koa from Hawaii, zebrawood from the African veldt, avodire and primavera from South America, and teak from India. About 1,000,000 bd. ft. of these materials are stored in a yard adjacent to Weber's shop to meet current production requirements. Another 1,500,000 bd. ft. are stored in an area some distance away from the shop for use in replenishing the production stockpile.

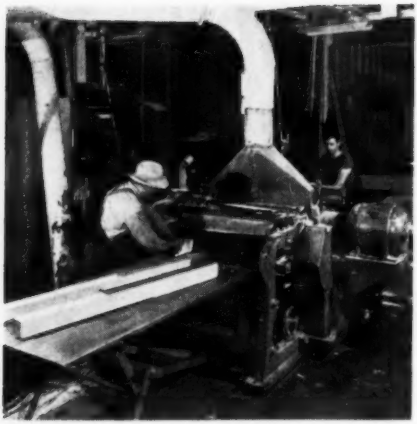
As orders come in, stock bills are sent to the yard where clerks select specified materials. Big mill trucks next carry the materials to a stock cutter, who cuts them according to instructions. The instructions are on route tickets attached to mill trucks and small hand trucks (which carry materials throughout the shop to various machines).

Cut-stock materials go to a Mattison straight-line ripsaw or to a twin band re-saw as necessary. Then they are faced with an Oliver jointer and double-surfaced with a Whitney planer.

As many as nine different molds may next be used in processing a single



A ripsaw is used to cut much of the material.



Wood materials are planed with this Weber production setup.

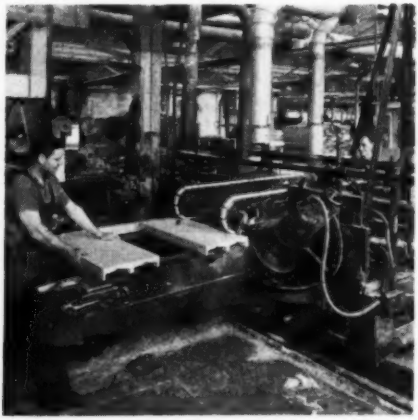
wood component with Weber's battery of three Mattison molders, which comprise one 12" and two 6" machines. Templates are made somewhat oversize to allow for such operations as sanding. Instructions for their use are listed on the route tickets.

Two CKL double-end tenoners save more than 500% of the time that was once spent jointing, ripping, trimming, rabbeting, nosing, and beveling by making it possible to form lips and round corners on timber components in a single operation. Special trim and scoring saws permit use of the same machines to cut veneers.

A sticker is used by a Weber production worker.

Steel gauges with tolerances up to 0.005" are used in making various wood cuts, and many right or left setups are made with beveled steel right angles with saw attachments.

Contours for virtually all shapes can be produced by Weber with either of two spindle shapers, each of which has knives set in two steel collars. The knives have identical weights for balance and circular cut with wood grain.



Double-end tenoner used in Weber's manufacturing operation.

Gluing time is conserved by means of a Berthelsen hydraulic glue box clamp which, with two side frames, can be adjusted two ways for use in gluing any type of frame.

A Berthelsen steam press permits the rapid lamination of veneers because it is equipped with automatic time, heat, and pressure controls which can be adjusted for the production of panels made with various materials. Two large

Materials are assembled with glue clamp framing as shown here.

mechanical presses sometimes facilitate the production of special wood laminates in limited quantities with dielectric heating equipment.

Flat piece gluing is also done with a Black Brothers spider machine where large surface areas are involved. Hand clamps often serve the same purpose where work areas are small.

Other standardized machine tools in the Weber plant include a 48" Tannewitz band saw, two big Yates-American drum sanders, 15 table saws of various makes, a pair of Mattison belt sanders, an Ekstrom-Carlson pin router, an Onsrud borer, and two Greenlee multi-spindle borers.

In addition to standardized tools, Weber has a number of special production machines. For example, a combination routing and boring tool that has been developed by the company makes it possible to produce up to 3000 shelves daily by automatically notching two corners and boring four holes in and on parts which are held in place by a pneumatic clamp.

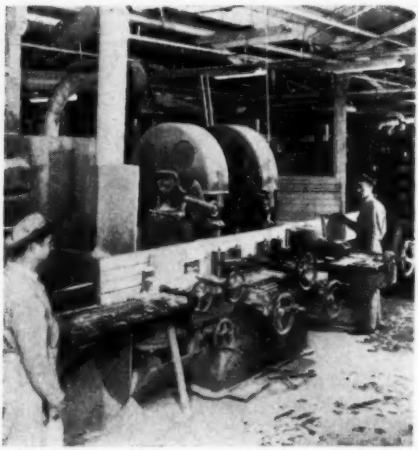
Similarly, to permit the sanding of veneers and laminates with thicknesses ranging down to 1/40", the company has devised a machine which holds materials in place with electrically-actuated air clamps. The latter machine, when equipped with a suitable steel boring bar, can also be used to accelerate boring holes in parts which fit together. The boring bar has bushings which make it possible to locate holes rapidly and accurately with a portable electric drill.

Conveyor lines used by Weber com-

Cutting plywood with a panel saw.

A dielectric heater with manual gun-type output unit is used to cure adhesive coatings which bond the components of one of the wall partitions.

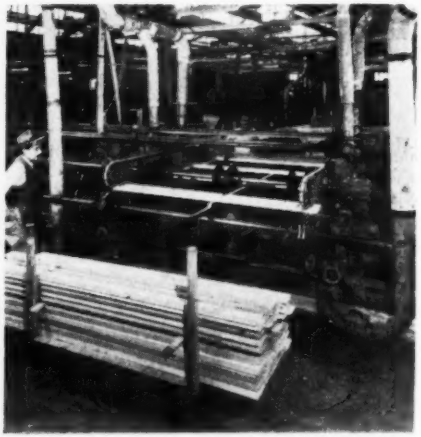
prise turned-up furniture casters secured to wide planks. Fixtures are mounted on boards above the casters for easy movement to consecutive assembly stations. Because the casterboard units are relatively small, assembly lines can be readily lengthened or shortened as necessary to adapt them to varying production runs.



Weber workers make use of a twin resaw.

An overhead vacuum system, installed throughout Weber's wood shop, carries sawdust and other small scrap from all work stations to an incinerator room where the waste materials are burned. This system is powered by a pair of 75 h.p. motors, and its constant use serves the two-fold purpose of minimizing the possibility of fires and promoting the sort of cleanliness that enables workers to respect their jobs.

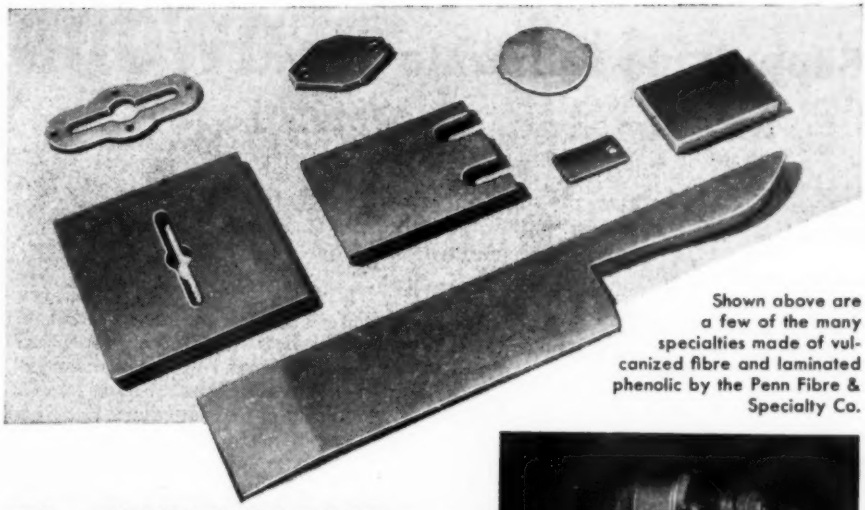
Assembled products are finished in a series of more or less conventional booths with both pneumatic and steam



This is one of two double-end tenoners which help increase production and save time and money.

spraying facilities. Steam power is preferred where synthetic enamels or thermosetting-type materials are applied. Pneumatic guns are used to spray lacquers and related types of thermoplastic coatings.

The walls of the spray booths are finished with vinyl-type strip coatings. Because they can be peeled off without difficulty after accumulating substantial quantities of over-spray, such strip coatings greatly facilitate the task of cleaning the booths.



Shown above are a few of the many specialties made of vulcanized fibre and laminated phenolic by the Penn Fibre & Specialty Co.

"The FOLEY SAW FILER saves us $20 to $30 per month"

William K. Davis,
PENN FIBRE & SPECIALTY CO.
Philadelphia, Penn.

In manufacturing their products, Penn Fibre & Specialty Co. is constantly cutting vulcanized fibre and Bakelite. Says Mr. Davis—"vulcanized fibre is hard on saws, which require frequent sharpening and setting. We find a Foley Saw Filer in our own plant is more convenient, saves 'down-time', cuts our saw sharpening costs and enables us to own fewer saws. Anyone can learn to use the Filer. We have realized savings of $20 to $30 a month since installing the Foley Saw Filer."

FOLEY SAW FILER OPERATING DATA

Materials cut.....Vulcanized Fibre, Bakelite in thicknesses from 5/1000" to 1½"
Foley Saw Filer used for.....2 years
Average weekly use.....4 hours
Number of operators.....Two
Previous experience.....None
Saws filed....about 4 dozen band saws ⅜" to 1" wide, 18' long
6 circular saws 10" to 12" diam.
Previous saw filing method.....Custom filing by outside shop

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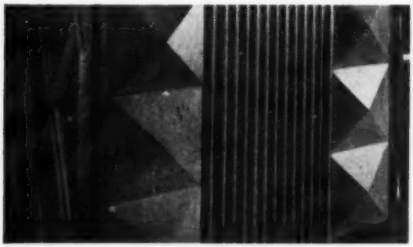
For mass production items and specialty work alike, economical shop-grade California Redwood offers real advantages to the millwork manufacturer.

INTRICATELY-CUT outdoor Redwood sign will resist weathering for years, even if left unpainted.

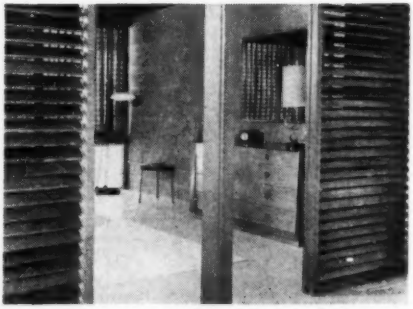
Redwood's unique combination of natural properties—workability, durability, strength, light weight, glue-holding power, dimensional stability—enable it to do more jobs better than any other commercial wood. And where jobs call for a variety of lumber lengths, low cost shop-grades can be used.

You'll see Redwood at work in the photos on this page. Why not put it to work for you? For information on specific uses of Redwood, write the California Redwood Association, 576 Sacramento Street, San Francisco 11.

This Association includes sixteen of the nation's top Redwood lumber mills: The Pacific Coast Co., The Pacific Lumber Co., Rockport Redwood Co., Simpson Redwood Co., Union Lumber Co., Warm Springs Redwood Co., Willits Redwood Products Co., Wolf Creek Timber Co., Inc., Arcata Redwood Co., Eureka Redwood Lumber Co., Hammond Lumber Co., Hollow Tree Redwood Co., Holmes Eureka Lumber Co., Hulbert & Muffly Lumber Mill, M & M Wood Working Co., Northern Redwood Lumber Co.



DECORATIVE DETAIL of Redwood paneled wall displays workability, beauty of grain pattern and color.



ROLL-AWAY WALL of adjustable-louver jalousies show Redwood's natural beauty, dimensional stability.

THE HOUSE OF REDWOOD

By Bert Goldrath

MEET a comparative newcomer to the woodworking field—redwood wall tile. The idea and the product described here were developed by William R. Oeser of the House of Redwood in Redwood City, California. Oeser has high hopes that the beauty of the tile and numerous uses to which it can be put will capture the public fancy.

He developed the idea while working at his hobby—making redwood indoor and outdoor furniture. An auto upholsterer for upwards of 30 years, Oeser loved to fashion the native California wood into attractive chairs, lounges, tables and lamps.

"Redwood is not easy to work with, though," he warns. "It's easy to saw, but so soft that it's susceptible to nicks if you're not careful. That means more handwork."

A year ago Oeser and his wife Rayma plunged into the woodworking business with both feet. The opening of their House of Redwood was announced in full-page newspaper ads.

Visitors to the shop were delighted and astonished over something they had never seen or heard of before. Two entire walls of the office were paneled with gleaming redwood tile. That's how a brand new product made its bow to the world.

The tile itself comes in $2\frac{3}{4}$"x$5\frac{1}{2}$"x$\frac{5}{16}$" size, and in $2\frac{3}{4}$" square size. Shop-grade kiln-dried redwood is used, rather than clear heartwood, because

Redwood as a motif is carried as far as possible in the handsome exterior of the House of Redwood.

Redwood tile is laid in a specially-developed clear mastic, much like any other kind of tile.

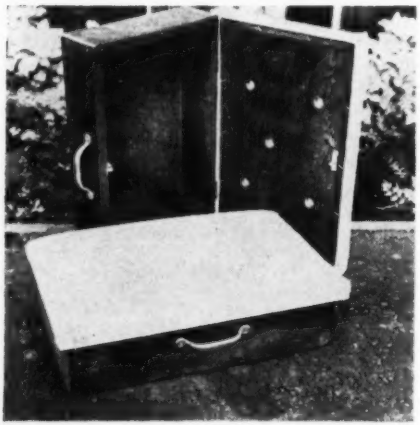
the knots and grain add to the beauty of the surface. Oeser had a special mastic developed which is applied to the wall with a brush and dries clear. After application in any one of several patterns, the tile can be left unfinished, waxed, or finished with clear shellac, varnish or lacquer.

Originally intended for use in offices, dens and rumpus rooms, the new product has proved ideal for application to wood planters and for coffee table tops.

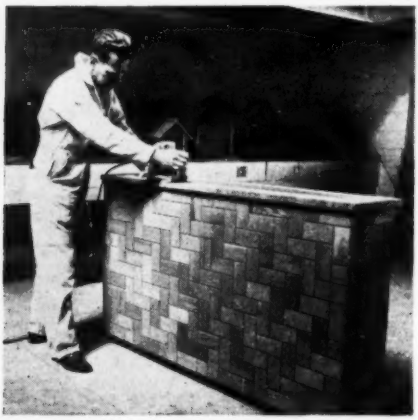
Retail price is approximately $1.15 a square foot, about on a par with ceramic tile.

The tiles are turned out with four beveled edges. Original two-minute production time per tile has been cut to 20½ seconds with progressive methods.

The House of Redwood is also engaged in the production of such redwood furniture items as a free form coffee table, a new style of three-piece sectional sofa with concealed wheels which seats five persons, a tiered corner table, floor and table lamp, love seat, settee, several models of chairs and lounges, "gin rummy" table-and-chair combination with umbrella, and round cocktail table. Besides furniture, Oeser also turns out small and large trellises, a garden kneeler which doubles as a tool cabinet (his own invention), hanging flower baskets, bird houses and mail boxes.



House of Redwood is a house of ideas. This garden kneeler, covered with a foam rubber pad, is also used to carry garden tools.



Another use for redwood tile is to add a strikingly decorative touch to such home furnishings as planting boxes.

KILN DRYING Forum

Question

I have been criticized for keeping the spray valve closed while I bring up heat and humidity at the beginning of the kiln run. I started doing this during the winter months because with the spray valve on there was a tendency for the steam to condense on the lumber instead of being in suspension in the air. By keeping the spray valve closed, the surface moisture of the lumber evaporated to build up the humidity towards the desired point. What is wrong with this practice?

Answer

Keeping the valve closed temporarily in the winter is practiced by other operators for the purpose you describe. The chief danger lies in keeping the spray valve closed too long. If this is done, any of the following conditions could result: (1) Too much surface moisture could be taken from the lumber, i.e., all surface moisture and then some surface drying. This could set up immediate tension in the lumber. (2) There might not be sufficient moisture to bring humidity up to the point desired so that the wet bulb reading would level off at a point lower than desired. This in effect would be like beginning the drying schedule with an unsuitable relative humidity. (3) Assuming there is enough surface moisture to push the wet bulb reading up to the desired point, there is an imminent danger of leaving the spray valve closed long enough to permit the wet bulb reading to drop below the desired point.

Question

How long should it take me to dry 4/4 Douglas fir down to 10%?

Answer

It would not be possible to give you an intelligent answer without knowing initial moisture content, type of kiln, required end use, etc., but for comparison purposes a concern drying Douglas fir shop and better dries this lumber down to 10% moisture content in about 5 days. The drying schedule starts with dry bulb at 160 and wet bulb at 145. Settings are 180 dry bulb and 140 wet bulb from the fiber saturation point to final 10% moisture content.

Question

How much boiler capacity can be saved by the use of exhaust steam in kiln drying?

Answer

Found no published information on this question but a plant owner who made the switch about a year ago reports that use of exhaust steam at about 4 lbs. pressure saved his plant about 150 h.p. of boiler capacity in the kiln operation.

Question

We are experiencing difficulty in holding desired humidity conditions in our kilns. We are drying green lumber of fast and easy drying species but have a vent area of only 10 square feet per 1,000 feet of lumber. What is the average vent area requirement?

Answer

In drying the species you state are being dried, a vent area of 20 to 30 square inches per 1,000 board feet of lumber may be required. Many operators find that vent area requirement is influenced considerably by kiln temperature and where desired results are not obtained by venting and humidification, temperature adjustment provides a corrective remedy.

Question

Can you recommend a good fast drying schedule for green white birch squares up to 1½" in size?

Answer

The primary consideration for drying white birch squares from a green condition are a uniform, quick air circulation and venting capacity sufficient to hold down relative humidity during the early stages of drying when considerable water is evaporated from the wood. If slight discoloration of the white sapwood is not objectionable, the following schedule should bring desired results:

Moisture Content Per Cent	Dry Bulb Degs. F.	Wet Bulb Degs. F.	Relative Humidity Per Cent
Green to 45	140	125	64
45 to 30	140	120	54
30 to final	180	135	30
Conditioning .. (6 to 8 hours)	180	170	79

If whiteness is a primary requirement, best results have been obtained with a lower starting temperature, in the neighborhood of about 120 degrees F., using the same relative humidity values.

Question

We require information regarding radiating surface of plain kiln pipe to calculate a kiln conversion job in comparison with an estimate of tin pipe footage recently submitted. Is there any table available that will give us this information?

Answer

A table sometimes used for this type of estimation based upon square feet of radiating surface per linear foot of pipe is as follows

Pipe Diameter Inches	Radiating Surface Per Linear Foot Square Feet
¾	0.275
1	0.346
1¼	0.434
1½	0.494
2	0.622
2½	0.753
3	0.916

Question

We have a good supply of hard burned brick to use in the construction of our new dry kiln walls. Is this suitable material for kiln construction? Are there any specific requirements for mortar to be used in this application?

Answer

Specifications for dry kiln brick walls call for hard burned brick, common or face type. The main consideration for mortar to be used in laying the masonry is that little lime be used as vapor acids attack and quickly disintegrate the lime to leave openings through the mortar joints. It is also important that the brick wall be adequately protected against moisture absorption by coating with a suitable kiln paint or similar protective coating.

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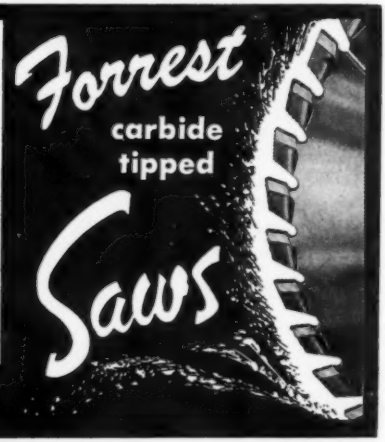

Question

I am being broken in as a kiln operator by an old timer who is about to retire. He insists upon steaming every charge before drying and has sold management upon this practice. What arguments can I use to sell management that this preliminary steaming is not necessary?

Answer

Common kiln drying practice accepts the assumption that preliminary steaming serves no useful purpose and in effect prolongs the drying period to increase drying costs, since the saturated kiln air must be vented before the lumber will begin to dry. If you are drying previously air-dried stock, you should be able to show that this steaming operates to reopen air seasoning checks.

Question

Since better control has been installed in our kilns which requires steam feed to be intermittent rather than almost continuous, as was formerly required, we have been bothered with temperature variations along the length of the kiln. The coils are relatively long and large and drain by gravity. What could cause this and how can we remedy the offending condition?

Answer

The coils may not be properly designed for intermittent steam feed so that current steam pressure will be effective to a point them of air and condensate. Increasing steam pressure will be effective to a point but proper design would be a more lasting remedy. Long and large coils require higher steam pressures to discharge condensate and air. Shorter coils and a more efficient trapping system could improve the present condition. Too high steam pressures can cause considerable temperature variations where radiation is excessive. Recalculation of radiation requirements and redesign of the coil system seems to be indicated.

Mrs. White (to tramp at the door)—"Are you really content to spend your life walking around the country begging."

Tramp—"No, ma'am, many's the time I wished I had a car."

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CUT DOWN CUT-OFF SAW

For All Types of Plants Where Fast Precision Cutting is Required

Swings on roller bearings. Right or left angle cuts to 45 degrees, 7" wide. Saw size: 10" diameter of table 16", motor ¾ H.P.

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MODERN WOOD

One of the country's newest and most modern wood preserving plants began operation at Horseheads, New York, late in 1954. It is operated by the Wood Preserving Division of the Koppers Co. Inc.

Wood preserving had its beginning in the need of railroads to find a solution to costly and frequent replacement of ties.

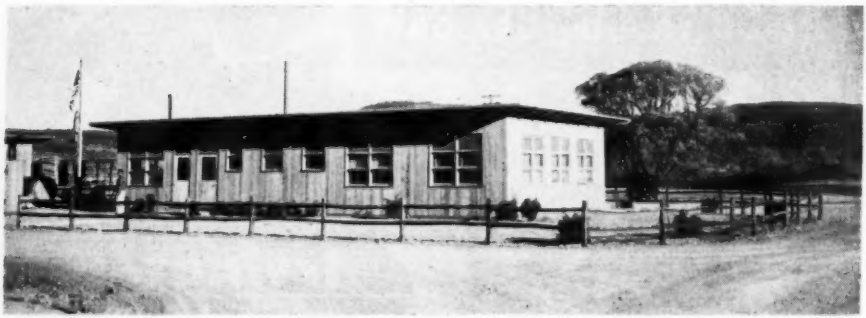
The new Horseheads plant, principally an outdoor operation on an 83-acre tract of land, is ideally located to serve its principal railroad customers, the Erie and the Lackawanna. It is bordered on the east and west by the main lines of both roads.

The plant is also favorably located to serve a large rural population with fence posts, barn poles, vineyard stakes and lumber for fencing and building. Wood treated with creosote has a useful life of at least five times longer than that of untreated wood.

Other products treated at the plant include utility poles, foundation and marine piles, lumber and small poles.

The plant itself is neatly arranged and scrupulously clean, despite the outdoor nature of its operations. A quarter million railroad ties are stacked in rows of timber mountains, poles piling are carefully piled near the many railroad spurs lacing across the yards.

Material for treatment can be easily transported to the planing or the adzing and boring mills to be processed to meet the buyers' specifications. From those mills the wood products are stacked on low-slung trams which are pushed by a diesel-electric engine into a 132-foot long steel cylinder.



Office building at Koppers wood treating plant. Wood in building, which is an attractive example of modified pole-frame-type construction, is pressure treated with CZC (FR), Koppers fire-retardant preservative.

PRESERVING PLANT

The cylinder has a huge door on the business end which is locked and sealed by a hydraulic closing mechanism that eliminates hand or electric wrenches and saves considerable time. Eight feet in diameter, it is the largest door of its kind in existence.

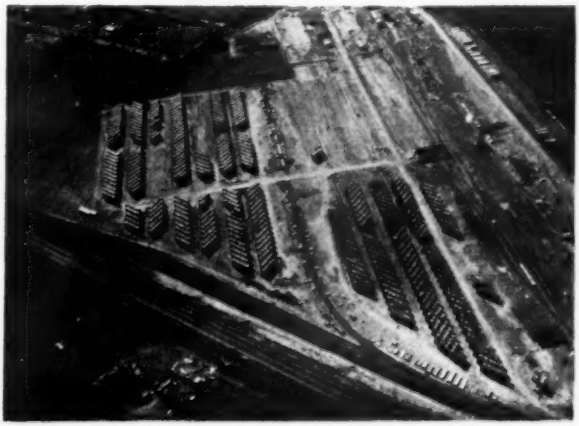
Inside the tank, the wood is subjected to air pressure of from 40 to 100 pounds, depending on the type of wood; the tank is filled with 30,000 gallons of creosote, and air pressure is increased to 200 pounds a square inch to drive the preservative deep into the wood cells.

When the required time for penetration has elapsed, the tank is drained and a vacuum is established to drain off the excess. Spectators can detect no odor when the huge door swings open and a dozen tram loads of the lumber are withdrawn from the cylinder.

Every precaution has been taken in designing the operation to prevent noise, odor and smoke. Sawdust and chips from the planing and boring mills, for example, are sucked into huge pipes by exhaust fans and are carried to a central incinerator where it is burned once a day to dispose of the waste.

Koppers has an earnest and sincere desire to be a good neighbor in communities in which the company operates and in being a good neighbor the company attempts to do its full share in making the community a desirable place in which to work and live.

A major source of noise and smoke in wood preserving plants of a few years ago were steam engines used in the

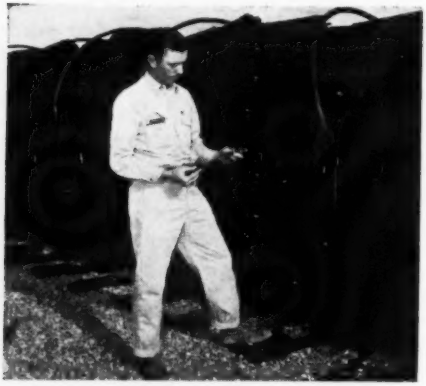


Herringbone pattern is produced by stacks of railroad crossties in seasoning yards. Ties are unloaded on track in center of storage yard; then stacked by lift trucks for 6 to 12 months of seasoning. Herringbone system of stacking permits more efficient maneuverability of mechanical equipment.

Poles for power and telephone companies are pressure treated by Koppers at new Horseheads wood treating plant. These southern yellow pine poles were shipped from South Carolina and Alabama.

transportation of wood products from one process to another in the plant area. At Horseheads, Koppers is using diesel engines which operate with comparative quietness and emit no smoke. Virtually all odor is contained in the modern-type closed treating cylinders.

Koppers has also built a completely modern plant which includes a boiler house equipped with oil burning units; therefore, to a great extent, smoke has been eliminated.



Thousands of small tie plugs are treated. These plugs are placed in holes in crossties from which spikes have been removed in the process of track relocation or the installation of new rails. Bernie Shunk, foreman at the plant, examines treated stakes, each consists of five plugs.

Plans at the new plant call for initial processing of about a half million ties a year for the Erie and Lackawanna railroads, as part of the approximately 40,000,000 board feet of wood to be handled.

Creosote is produced for the new plant by Koppers and other suppliers. Crossties, red oak and mixed hardwoods, obtained locally and along the railroad right of ways, remain in the yards for 6 to 12 months prior to treatment.

A service building on the property contains lunchroom, locker and shower facilities for the plant's employees. There also is an office building for administrative personnel.

Unique features of the new plant are an automatic unloader capable of handling 350 ties an hour; the electric-hydraulic operated door on the huge pressure cylinder; and the use of wood, pressure-treated with a fire-retardant preservative, in construction of the office and service buildings.

These two buildings also employ a pole-frame type of construction which needs no foundation because the supporting members are pressure-treated, guarding them against destruction by

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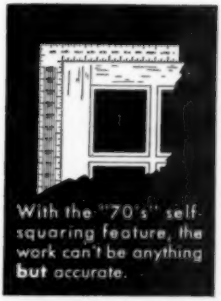
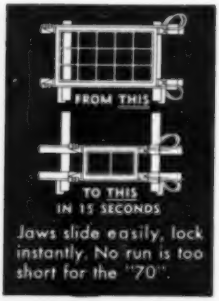


With the "70's" self-squaring feature, the work can't be anything **but** accurate.



Jaws slide easily, lock instantly. No run is too short for the "70".

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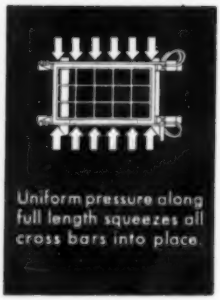

Uniform pressure along full length squeezes all cross bars into place.

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Section of seasoning yards at Koppers Horseheads plant. Plant has storage capacity of 700,000 crossties. Lift trucks transport ties from railroad cars to stacks and remove them after 6 to 12 months for adzing and boring prior to treatment.

decay or insects even though they are in constant contact with the ground.

Koppers has long maintained the policy of purchasing from local timber operators and wood lot owners as many wood products as will meet established specifications. This year Koppers will purchase several hundred thousand red pine fence posts from local suppliers so that it can maintain a constant stock of at least 25,000 fence posts to supply to local dealers who market the product.

If possible, thousands of crossties, oak and mixed hardwoods will be obtained in the southern New York region. If suitable timber stands are available, Koppers also will purchase barn poles, utility and telephone poles and piles locally.

"There is no such thing as luck. It's a fancy name for being always at our duty, and so sure to be ready when good times come."

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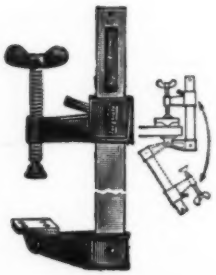

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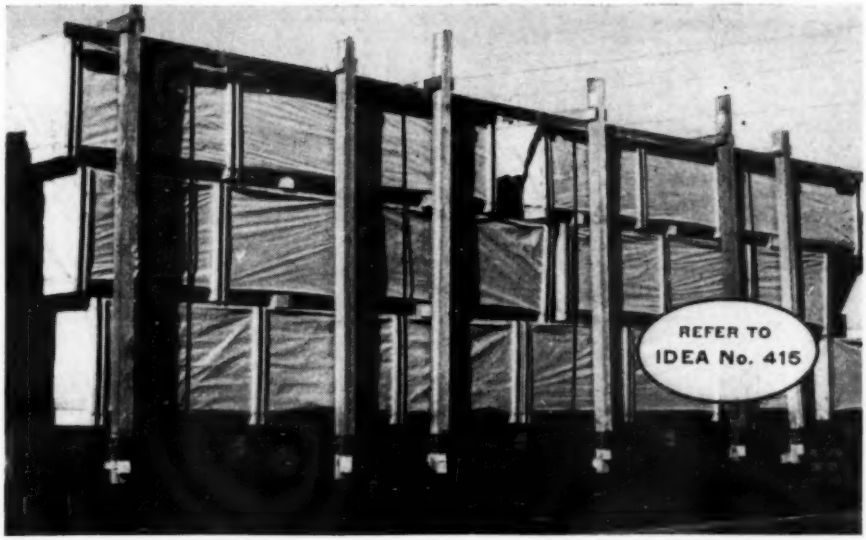

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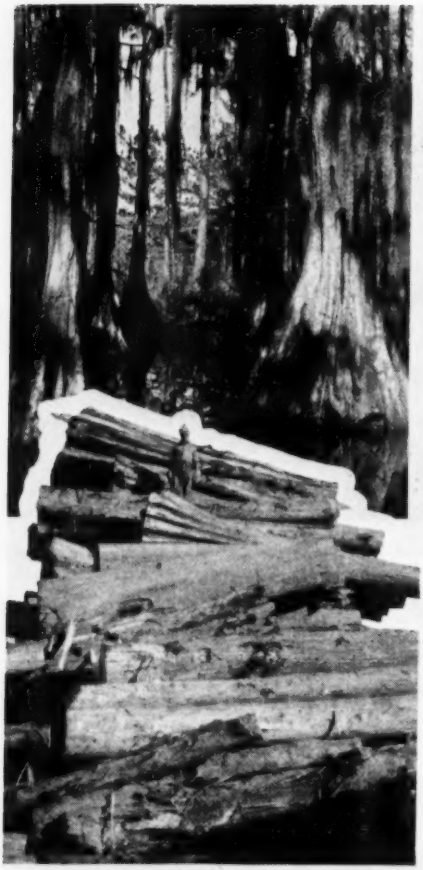

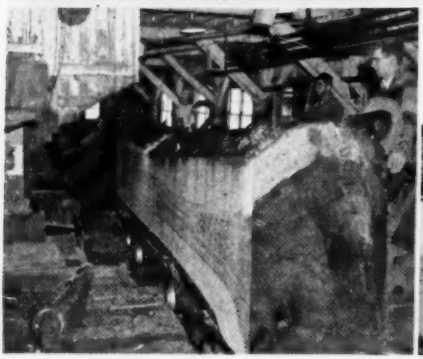

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The lift truck is handling lumber for proper seasoning on our Knoxville mill yard. All are examples of Atlantic's vast resources.

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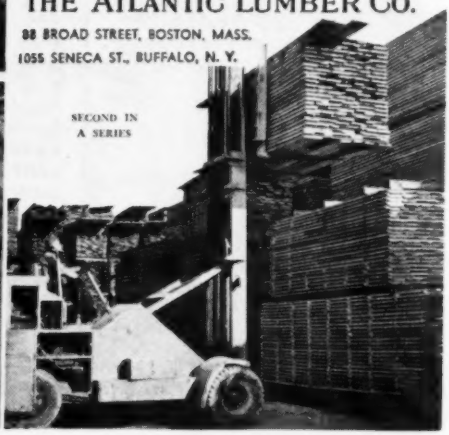

RIGHT or WRONG ?

A roundup of day to day in-plant problems and how they were handled by management men. Each incident is taken from a true-life grievance which went to arbitration. Readers who want the source of any of these cases may write to WOOD WORKING DIGEST.

Does "Equal Pay for Equal Work" mean that all employees doing the same jobs have to receive similar rates of pay?

What Happened:

The company had a policy which read as follows: "The principle of equal pay for equal work shall be applied without discrimination." Four employees were in the same department, doing the same work. The workload was about equally divided. But one of the employees (Pete Dalber) was getting about $5.00 a week more than the others. This was the result of a merit-rating increase. The workers contended that because they did the same work as Dalber, they too should get the same merit raise, in line with the principle of "equal pay for equal work." Everyone agreed that all four employees turned out about the same amount of work.

Were the workers: Right ☐ Wrong ☐

What Arbitrator Ralph Seward Rules:

"Merit rating is concerned not with what the employee does but how he does it. To contend that merely because employees are performing the same kind of work they should receive the same merit rating indicates the same confusion between the functions of job classification and merit rating. Such a contention would destroy merit rating entirely. Though the three employees are competent workers, none of them has shown the same level of initiative, none has demonstrated as thorough an understanding of his work or a comparable ability to meet unusual scheduling problems effectively and without advice and direction of supervision. The grievance is denied."

Can an employee be disciplined for not giving a reason for his absence?

What Happened:

Herman Proehl called the company five hours prior to starting time and left word for his foreman that he would not be in to work on the shift. On his next tour of duty, when he returned, his foreman asked why he had been absent. Proehl said "personal reasons" and refused to elaborate. He was given

a 3-day layoff. When the case came to arbitration, the union defended the employee by citing a company rule: it said that a worker can be disciplined if he "fails to notify the company when absent from work or fails to give satisfactory reasons for such absences." "The worker," said the union, "doesn't have to do both." Proehl notified in advance, and therefore fulfilled the obligation required of him.

Was the union: Right ☐ Wrong ☐

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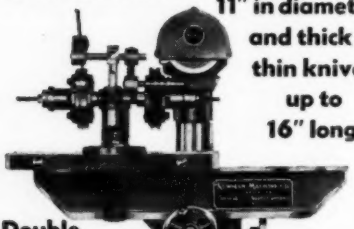

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What Arbitrator Walter G. Seinsheimer Ruled: "This arbitrator reluctantly finds that Mr. Proehl has complied with the contract as written. The contract does not specifically say that he must notify the company four hours in advance and present a reasonable excuse. It is obvious to this arbitrator that Mr. Proehl has taken advantage of the wording of the contract, and that unless the contract is changed in the future, the same advantage can be taken by anyone who so desires.

"Under the facts and circumstances of this case, Mr. Proehl, not having violated the letter of the contract should not have been given a 3-day suspension.

"Therefore, the company should reimburse Mr. Proehl for the 3 days."

Can you fire an employee for getting into debt?

What Happened:

Sidney Nelson borrowed $500.00 from a savings bank. He paid back all of it but $42.90. His wages were garnisheed, and the company paid up through deductions from Nelson's pay. A year later his pay was attached again, this time by a doctor who got judgment for $58.39. When this happened, Nelson was fired. He claimed the action was unfair on the following grounds:

1. Garnishment of pay is not proper grounds for discharge.

2. Personal financial problems of employees are not relevant to an employment relationship.

3. The company had no written policy which made garnishment a punishable offense.

Was Nelson: Right ☐ Wrong ☐

What Arbitrator Mack Kahn Ruled:

" . . . Garnishments are not uncommonly a basis for disciplinary action by employers who have unwillingly been made a party to the personal financial obligations of employees. Some employers object to garnishments as incidents of petty expense and annoyance, necessitating special bookkeeping and the appearance of company representatives in court. . . . the company has a legitimate right and, indeed, an obligation to impose and to insist upon minimum standards of personal financial responsibility on the part of its employees. Moreover, the failure to maintain such standards might harm the company by leading to the imposition on the company of higher insurance rates or bonding costs.

"The problem in this case is that such a policy has not hitherto been clearly defined and communicated to the employees. Nor has the issue previously been brought to a head in such a manner as to assure a definite awareness by the employees of the position of the company in this regard.

"The record does not disclose any clear-cut statement of policy or preliminary warning to Mr. Nelson prior to the 'final warning.' Under the circumstances, however, for the reasons suggested earlier, the extreme penalty of discharge is excessive. Discipline should first be employed to correct, if possible, improper behavior on the part of an employee. Reinstatement of Mr. Nelson in his employment with the company without loss of seniority, but without compensation for the hours of employment lost as a result of his discharge, will serve this purpose."

"The man who's always boasting about his ancestors makes you wonder if his family's not better dead than alive."

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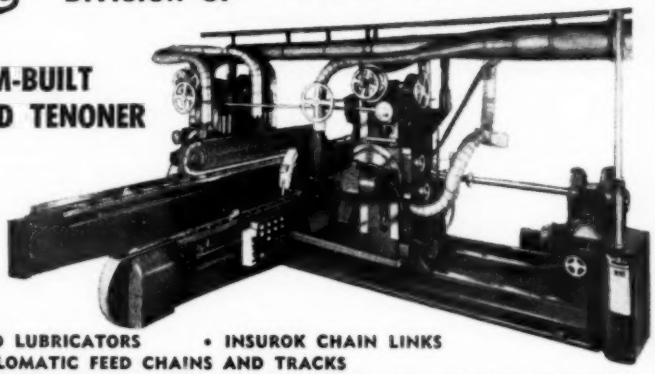

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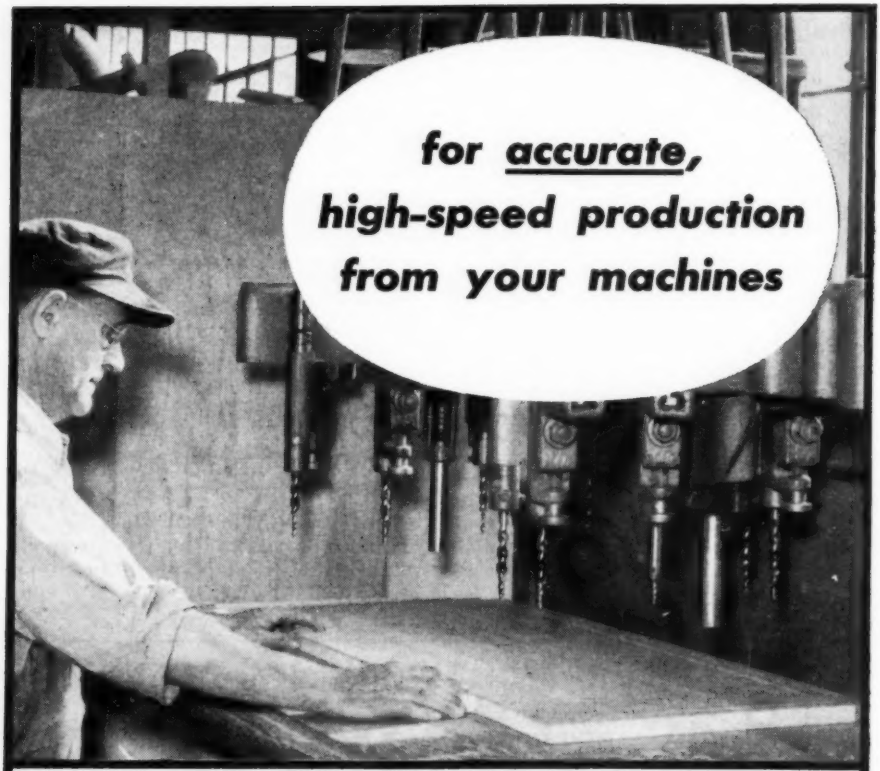

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Evolution of LUMBER DRYING TECHNIQUES and DRY KILNS

Part 17

By Paul H. Graham

PROBLEMS arising from reversible fan action in cross-circulation kilns brought about the development of improved control systems using dual dry bulbs and independent dry-bulb systems for two-end control of the kiln. A single wet bulb was usually sufficient to provide humidity control. In the two-end control system each dry-bulb system was equipped with two bulbs, one on either side of the kiln. Many single bulb control problems were eliminated by the use of dual-bulb transverse control in which two bulbs functioned as a single unit for kiln temperature control.

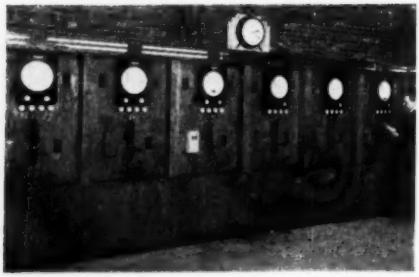
Actual control of temperature was actuated primarily by the sensitive bulbs, wet-and-dry-bulbs, which provided efficient operation only when they were exposed to adequate circulation of air and controlled entering-air temperatures. With the dual-bulb system, using two dry bulbs, one on each side of the lumber pile, this control was made possible. When air circulation moved across the lumber pile from left to right, the left-hand bulb was at a higher temperature and acted as the controlling bulb. With the air circulation reversed, the right hand bulb was at a higher temperature to make it the controlling bulb. Only a slight lag of control occurred when circulation was reversed.

Two-end control, with dual-bulb systems used at each end, tended to provide more uniform control throughout the kiln. In progressive kilns, where it was desired to control temperature along the length of the kiln, instruments with separate dry bulbs were usually used. Humidistats were employed to control heating equipment and add just sufficient heat to incoming air to maintain the desired relative humidity. These instruments mounted a humidity scale by which relative humidity settings were made.

Very few kilns could boast uniform temperature and humidity throughout the entire kiln chamber. This presented problems in locating control instrument bulbs properly for efficient control. Dry bulbs were required to be placed in the entering air stream, a difficult problem when a single bulb was used to control the temperature of a kiln with reversible circulation.

Although the dual dry-bulb system appeared the obvious solution, the problem was met in many single-bulb installations by undersetting the instrument by the estimated temperature drop across the load when controlling on leaving-air temperatures and going back to the original setting when circulation was reversed.

Needless to say, this constant readjustment was not popular with kiln operators and the single-bulb control problem was solved by placing the dry bulb in a by-pass duct. This arrange-



Courtesy Moore Dry Kiln Co.

Control room of Moore kilns at Rudolph Wurlitzer Co., North Tonawanda, N.Y.

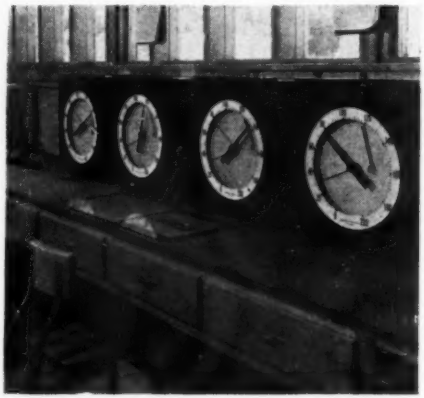
ment was adopted by some commercial dry kiln manufacturers in preference to the dual-bulb system to keep instrument costs down.

As shown by illustrations taken from The Forest Products Laboratory report No. R1654, "Temperature Measuring and Controlling Devices In Lumber Dry Kilns," the bulb could be located above or below the loads using air ducts large enough to permit free flow of air and easy access to the bulbs. The ducts were required to be flared at each end to increase the velocity of air through the duct and so located that air passing over the bulbs has been heated by the coils. In reference to duct-lengths shown in the illustrations, the report suggests that lengths of ducts may have to be increased considerably more than that shown, even to the point of extending it across the width of the loads. Ducts were required to be made of material that would not radiate much heat and designed and installed so as not to interfere with loading or unloading the kiln.

Experience showed best results were obtained when the bulbs were located in the hottest zone of the kiln, or where this was not possible, to underset the instrument by the difference between the hottest zone and the temperature at the location of the bulb. Location to prevent damage during loading and unloading of the kiln was also an important consideration.

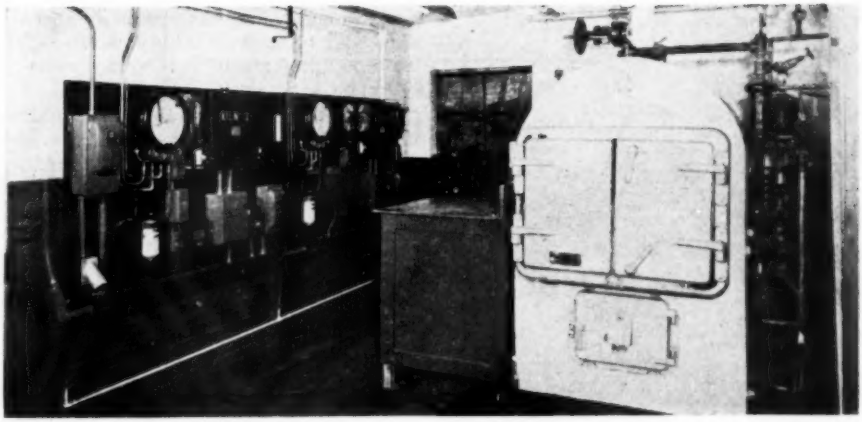
In dual dry-bulb systems best results seemed to be obtained by locating the two bulbs as close as possible to the hottest zone about half-way up the height of the load, and directly opposite each other. Extension arms were provided to swing control bulbs back out of the way for loading and unloading, and various shields, ducts and baffles were provided to control air path and shield the bulbs from radiant heat rays of heating coils, adjoining kiln walls, etc.

Requirement of constant water supply made it necessary to mount wet bulbs close to the source of supply. They were mounted on the side walls of the kiln, parallel or perpendicular to it, and in the bypass duct. In the former installation it was required to extend them far enough from the wall to reduce the effect of wall temperature and provide adequate circulation around them. The chief consideration in all installations was proper accessibility to permit replacement of wicks as often as necessary for efficient operation.



Courtesy Minneapolis-Honeywell Regulator Co.

Potentiometer controller control room for two kilns automatically controls temperature and humidity.



Courtesy Standard Dry Kiln Co.

Standard multi-zone recorder controller uses two independent dry bulb systems for temperature control of each end of kiln and third wet-bulb for humidity control.

Various electrically-operated automatic control systems were developed, many of which were not too successful. An electrically-controlled system which did give satisfactory results was a wet-and-dry-bulb recorder-controller which operated with electric contact points connected with springs which moved the arms, establishing maximum and minimum limits. Temperature settings were made with calibrated dials.

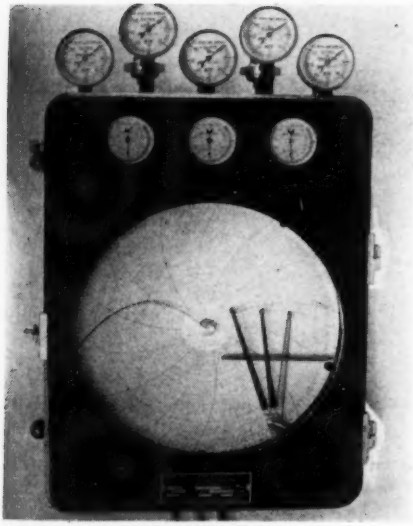
When kiln temperature exceeded the set point, contact was made with the maximum limit point which actuated small current through a relay which stepped up current to a motor valve on the steam line to shut it off. When temperature dropped, the minimum limit point was contacted so that electrical impulse opened the motor valve. Control was possible for close schedules or, by widening the contact points, for a wider range. The same operating principle operated a cycle steam spray system to vary wet-bulb temperature, as required.

It has been learned also that for full control of the kiln operation, control instruments often have to be supplemented as measurement of temperature conditions in a dry kiln requires testing of temperatures at various locations in a systematic manner, and standard control instruments integrated into an automatic control system are able to measure and control conditions from only their fixed locations.

Hygrometers or thermometers may be used for this purpose, and thermocouples provide an inexpensive and efficient means when they are portably or permanently installed at regular intervals along the length of the kiln.

Thermometers and hygrometers generally require more effort than thermocouples when used to make temperature distribution tests. Thermocouples permit a large number of observations to be made in various parts of the kiln quickly and easily, using a potentiometer with sufficient range of temperature scale, and also permit observation simultaneously of valve operation and other kiln conditions.

A wet-and-dry-bulb recorder- controller system was developed using thermocouples and potentiometers in place of the conventional wet-and-dry-



Courtesy Moore Dry Kiln Co.

Moore autograph master controller features independent controlling, automatic pen-lifting device, no connection between pens and setting mechanism, and sealed instrument protection.

bulb instruments. Thermocouples were used in multiple arrangement, in a ratio of about two dry-bulb thermocouples to one wet-bulb, throughout the kiln and connected through switches to wet-bulb and dry-bulb control instruments. The instruments were arranged to control from any given set of thermocouples (wet-and-dry-bulb) at the operator's discretion to suit kiln conditions previously checked by selective switch control.

With the advent of automatic control mechanisms, it was not at all surprising to learn that attempts were made to develop kiln drying into a fully automatic procedure. Automatic control systems were adapted for time-temperature control to change kiln drying conditions after a preset period of time. Cams were developed for various drying schedules of different species and thicknesses of lumber to make automatic controlled changes of temperature and relative humidity in the kiln by operating steam and spray valves, dampers and vents.

Due to the many variables in kiln design, initial moisture content, different rates of drying (even within the same species and thickness of lumber), etc., these fully automatic kiln drying systems did not work out satisfactorily.

Attempts to make kiln drying fully automatic were also made in the direction of control provided by varying weight of a selected wood sample. In a typical application of this principle an automatic pneumatic scale was clamped in place in a recess provided half-way up the side of the lumber pile to weigh a wood sample inside the kiln during the kiln drying cycle and to record this weight in terms of moisture content on a recorder mounted outside of the kiln. A temperature and humidity recorder-controller, containing the pneumatic setworks, was operated in conjunction with the automatic scale to control steam valves, dampers and vents.

The wood sample was cut from a board representing the highest moisture content of the lumber load, sealed across the grain to prevent too rapid drying of the sample, and end coated to prevent excessive end drying. The automatic scale was clamped to the side of the lumber pile, with the end of the scale beam carrying the sample projecting into the pile recess provided for it.

Using the automatic pneumatic connections for the air line, a gauge was first attached to permit setting the scale by air pressure to approximate the moisture content of the sample. The automatic scale was then connected to the recorder-controller, that was preset to desired schedule settings, and air pressure was admitted to the system. Individual step cams, cut to provide desired schedule settings, were used for control.

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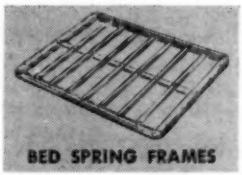

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In the operation of this control system the automatic scale beam rose to reduce air pressure in proportion to weight lost by the wood sample in drying. This movement caused the setworks to reset the drying control cam which then operated to reset the recorder-controller wet-bulb and dry-bulb control points. The controller, by air pressure, controlled opening and closing of steam and spray valves, dampers and vents. The control arrangement of this cale was quite similar to an adjustable air-pressure reducing valve placed in the air line between the supply and setworks to regulate air pressure.

Uniform drying proved to be practically impossible with this automatic control system, since the sample seldom reflected the true condition of the lumber load in drying or that of individual boards of the load. Since there was no provision for measurement of stress during the kiln drying cycle, no stress relief was possible. Time clocks and cams could automatically change temperature and humidity conditions but did not suit kiln conditions to requirements of the lumber being dried.

It must be concluded that automatic kiln controls will never take the place of a good skilled kiln operator, but they do provide good assurance that the drying conditions desired by the operator will be maintained. They provide the operator with technical control of the kiln and indicate and record the dry-bulb and wet-bulb temperatures at all times. They provide means for obtaining desired drying conditions in accordance with drying schedules established for various species and drying items. They eliminate the necessity of round-the-clock attendance.

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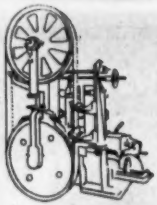

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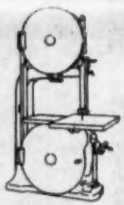

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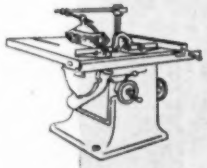

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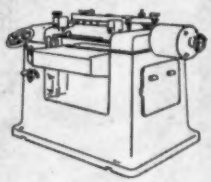

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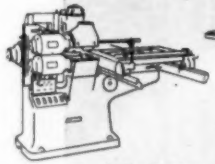

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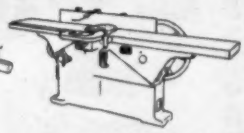

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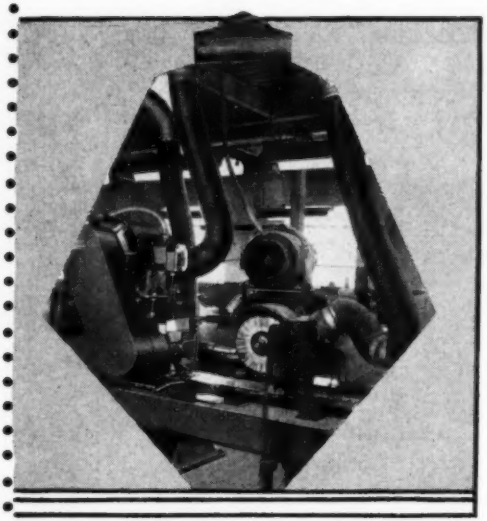

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New Literature

CEMENTED CARBIDES

Average investment required to equip a woodworking plant with cemented carbide admittedly is somewhat higher than for all-steel tools. But the higher first cost of carbide tooling is more than offset by the many advantages they offer the user, according to a new publication distributed by Carboloy Department of General Electric Company, Detroit, Mich.

The 28-page publication, bulletin WW-20, "Carboloy Cemented Carbides and Their Application in the Wocdworking Industry," states that carbide tooling can be substituted without difficulty on many woodworking machines.

It points out that increased operating costs, and competitive marketing conditicns have compelled the woodwork-

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ing industry to take a closer look at production methods. In many cases, it says, carbides proved to be the answer. Besides providing sharp production economies, carbides provide better work finish and greater dimensional accuracy.

The new publication, besides explaining what carbides are, includes information on machining wood waste and laminated products, tips in selecting carbide grades, operation and maintenance suggestions.

CUT COMPOUND ANGLES

Colorful new folder has just been released by Irvington Machine Works, 1808 N.E. 7th Ave., Portland 12, Oregon and 3 Colfax N.E., Grand Rapids 5, Mich., describing the No. 32 precision miter cutting saw and the No. 32B for cutting compound angles. Table mounted, 10" saw cuts 2x6 on straight cut, 2x4 on 45° miters— a versatile angle cutter and cut-off saw for wood moldings.

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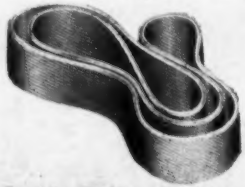
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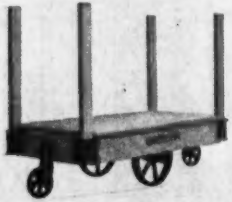
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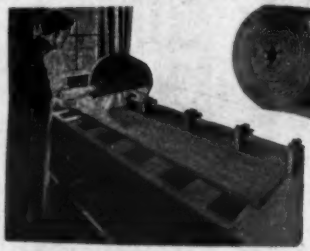
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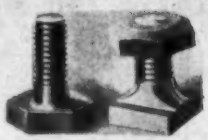
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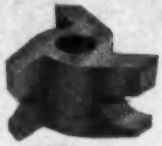
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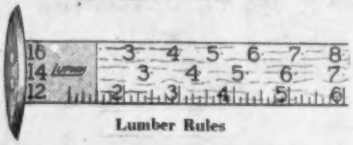
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It describes all types of standard portable electric tools, newly developed machines, and numerous attachments for specialized jobs. Step-by-step instructions on uses and "tricks of the trades" show the craftsman how to turn out more skillful work 12 times faster and with less fatigue than by old hand methods. More than 150 instructive photographs make this a practical basic guide for all manual workers. Unabridged special editions may be ordered from Porter-Cable Company, 55 Exchange Street, Syracuse 8, N.Y.

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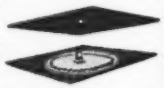

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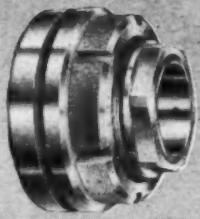

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PLYWOOD CATALOG

A new 1955 four-page basic catalog covering fir plywood grades and application data in condensed tabular form has been released by Douglas Fir Plywood Association, Tacoma 2, Wash.

The folder, based on revisions stiffening grade and quality requirements as outlined in the new U. S. Commercial Standard for fir plywood (CS45-55), is designed as a quick easy-to-read reference piece for builders, architects, specifiers and other plywood users.

Information in the catalog covers essential data needed in the construction field; type-use recommendations, standard stock sizes of both exterior and interior types most commonly available from distributors, recommendations of finishing, and applications for specialty products.

The catalog is designed for maximum simplicity and ease of use without sacrificing essential information.

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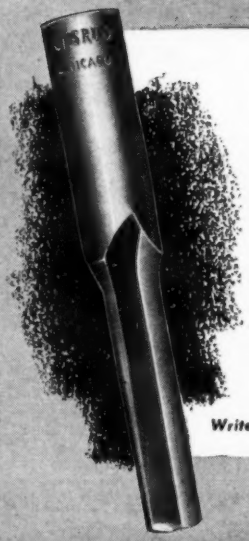

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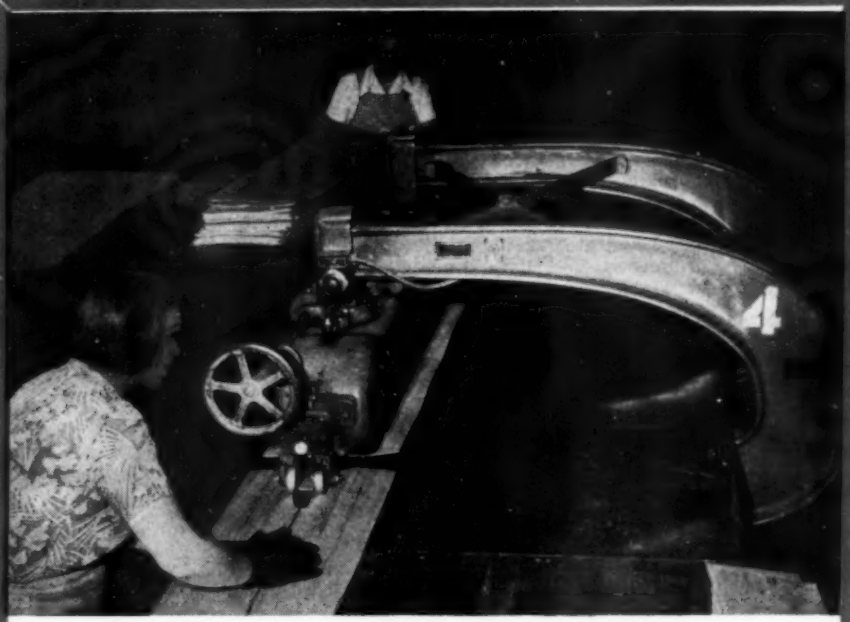

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GLUE SHIELD HANDSCREWS

The Wetzler Clamp Co., 43-15 11th St., Long Island City 1, N.Y., has just issued literature on the new "glue-shield" handscrews. The literature describes the shields as being made of soft metal to protect the jaws from the scraping that is usually necessary to remove glue from the wooden jaws.

The literature illustrates and describes the handscrews and lists the various sizes in which they are available.

WOOD HOG BULLETIN

A new four-page bulletin, describing the American swing-hammer hogs and shredders, has been released by the American Pulverizer Company 1249 Macklind Ave., St. Louis, Mo.

The literature lists and describes "a size for every operation, and a type for every material." Included is a discussion of design advantages for the uniform reduction of wood scrap for boiler fuel, also the reduction of other

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types of fibrous materials for extraction and processing purposes.

Features that mean higher production at lower operating costs are listed, and include: the rugged plate steel housing, easy-to-reach chamber design, renewable liners, heat-treated steel rotor, adjustable platen, metal trap, and manganese grate bars and heavy steel screen plates. Hammer types are illustrated for each type of reduction problem.

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KNIFE GRINDING MANUAL

The second edition of a book written by C. G. Monnett, Jr. has just been released to the general public. The book

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Extremely fast . . . efficient . . . automatic machine for mortising grooves for stationary louver-slats and boring holes in rolling blind-stiles.
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Write for Complete Information
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FESTO WOODWORKING MACHINES
46 Marino Ave., Port Washington, New York

contains 167 pages and 187 pictures, charts, and drawings, and is thought to be the most complete book of its kind ever published in the United States.

The following are some of the subjects covered by the Knife Grinding and Woodworking Manual: Grinding Knives; Setting Knives; Moulder Operations; Wood Defects; Balancing Knives; Composition and Care of Grinding Wheels; Jointing Knives; Development, Selection and Care of Cutterheads and Knives; Cutting Angles and Bevels; Cutting Speed, Feed Speed, and Energy Consumption of Machining Wood; Molder and Planer Machine Stoppages and Their Remedy; Structure of Wood; Lumber Abbreviations; Common Woodworking Pattern Names; Safety, and many other worthwhile subjects.

Copies of the "Knife Grinding and Woodworking Manual" may be obtained by writing to C. G. Monnett, Jr., vice-president, Dependable Machine Company, Greensboro, N.C.

LOCKJOINT CUTTERHEAD

Here is a fast-cutting, non-burning, accurate head for tenoning the familiar multi-tongued lockjoints efficiently, rapidly, and to close tolerances. Made to your specifications. High speed steel circular cutters are hollow-ground. Designed for heavy machines where 5 h.p. or more is available. Normally used on the cope spindle of a double-end tenoner. Write for further details . . . or tell us your needs.

EKSTROM, CARLSON & CO.

1400 Railroad Ave., Dept. W-9 • Rockford, Ill.

FLOOR TRUCK CATALOG

The Hamilton Caster & Mfg. Co., 1700 Dixie Highway, Hamilton, Ohio, offers a new 64-page catalog, illustrating and describing the firm's complete line of platform trucks, two-wheel hand trucks, shelf and tray trucks, box trucks, wagon trucks, skids, dollies, etc. for every industrial and commercial use.

The catalog includes full technical data and specifications on the Hamilton line, together with a special section illustrating available accessories, body styles and superstructures.

AIR CYLINDER DATA

Miller Fluid Power Company's new Bulletin A-105K gives complete, up-to-date design, construction, engineering and mounting and dimensional data on Miller 200 psi. heavy duty air cylinders from 1½" through 14" bores in

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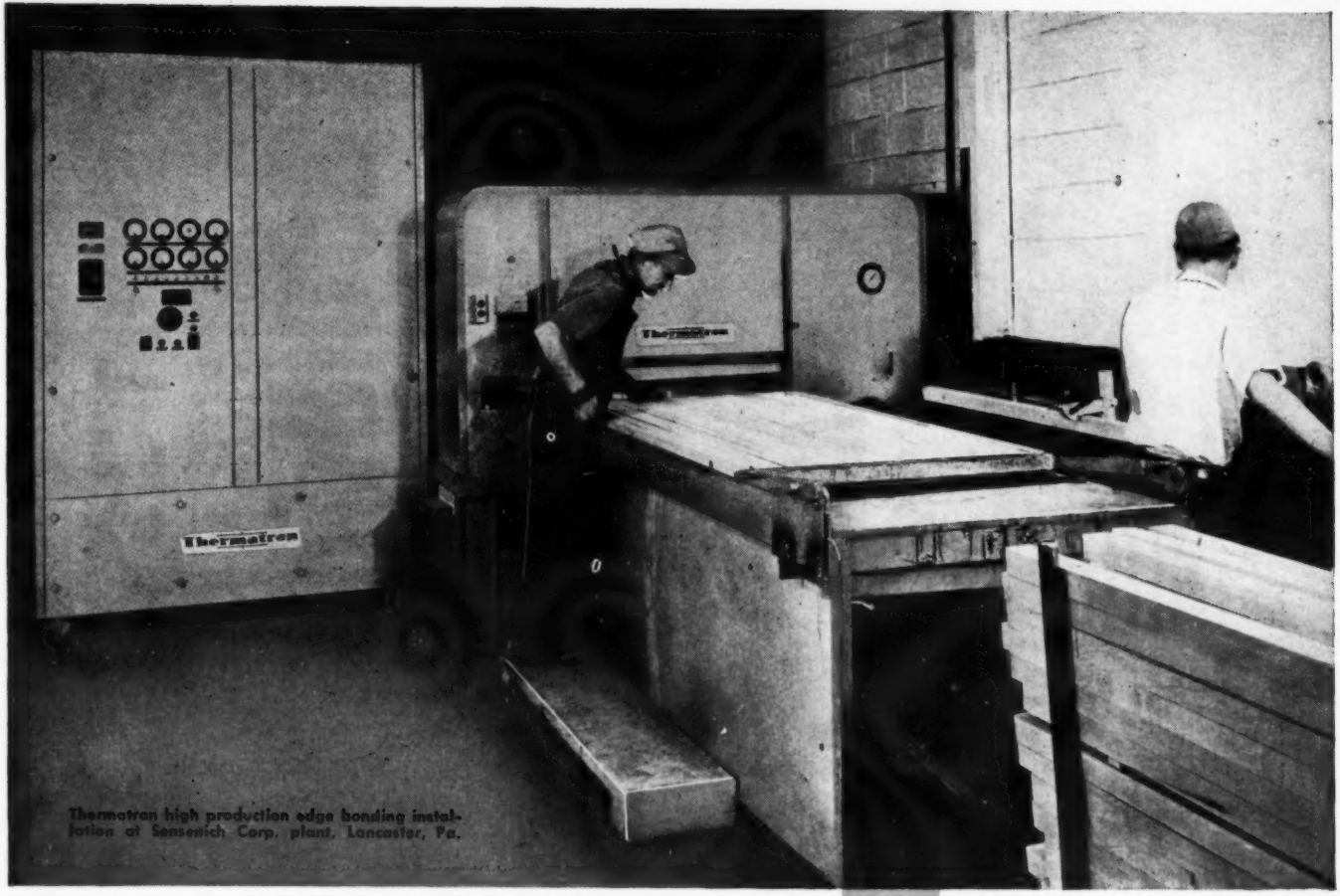

Thermatron high production edge bonding installation at Sensenich Corp. plant, Lancaster, Pa.

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For Edge Bonding

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WITH FULLY AUTOMATIC CYCLING AND POWER CONTROL

Crawford Manufacturing Corporation's new "1955 Model" furniture plant in New Bethlehem, Pa., was planned to take advantage of every technological advance available to the woodworking industry.

For such an essential part of their operation as edge bonding, Crawford engineers have selected THERMATRON equipment. Their own field surveys proved THERMATRON's automatic power control reduces production time even over previous *electronic* installations by a third or more.

This modern THERMATRON equipment accommodates a wide variety of loads, automatically adjusting to load conditions during the cycle. The exact status of work in process can be read easily on the control panel.

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The new bulletin is 8 pages, 8½" x 11", illustrated, printed in two colors, and hole punched for convenient insertion in standard catalogs. Copies available on request. Write Miller Fluid Power Company, 2040 N. Hawthorne Ave., Melrose Park, Ill.

Elbow grease is still the essential oil of industry.

FLUSH DOOR FOLDER

A new four-page comprehensive folder on flush doors has been announced by Atlas Plywood Corporation, 1430 Statler Bldg., Boston.

The fully-illustrated bulletin contains detailed descriptions of the company's line of hollow and solid core doors. Grades, core construction, light specifications, sizes and measurements are completely covered.

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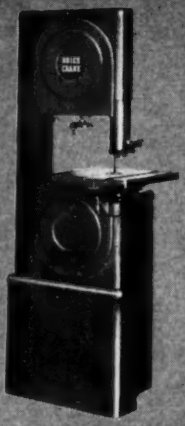

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Courtesy Sundstrand Machine Co.

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By C. A. Baker

Furniture Finishing . . . . . Part II

By Harold B. Gatslick

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82-58

FURNITURE FINISHING

Part 2

By HAROLD B. GATSLICK

THE sanding department is one of the most important in production furniture finishing. It is here that any inadequacies in machining must be overcome if a quality finish is to be obtained. Errors in sanding that go past the final "white sanding" inspector are often the most costly in the entire manufacture of a piece of furniture.

White sanding is a production cutting or machining operation to eliminate surface defects such as knife marks, to remove glue stains, blemishes or other pre-finishing flaws, and to give the wood surface optimum adhesive qualities. Before discussing suggested sanding techniques, it would be well to review the abrasive materials and their makeup.

Abrasive Materials

There are five abrasive materials employed in the manufacturing of coated abrasives. Three of these—flint, emery and garnet—are termed "natural abrasives," while the other two—silicon carbide and aluminum oxide—are synthetics which are produced in electric furnaces.

Flint is mined crystalline quartz crushed between hard steel rolls. It is employed to make the common flint sandpaper found on the shelves of hardware and paint stores. It has a 6.8 to 7.0 Moh scale hardness rating (diamond rates 10.0 and talc 1.0). Flint is one of the softest abrasive minerals used. Because of its low cost, it is used in removing old paint and varnish where its cutting action is impaired more by clogging of the grits than by dulling of the cutting edges.

Emery is a mixture of natural aluminum oxide and iron oxide, the best quality of which is obtained from Turkey and Greece. The iron oxide detracts from the efficiency of emery as an abrasive but adds to its polishing action. Emery is neither very sharp nor hard, and is used chiefly for polishing metals. Emery grain has magnetic qualities which cause it to adhere to ferrous metals. It has an 8.0 to 9.0 Moh scale hardness rating. It is much tougher than garnet, but has the poorest fracture of any of the minerals.

Garnet is a reddish semi-precious stone which produces a very sharp grain. It is harder and sharper than quartz with a 6.5 to 8.0 Moh scale hardness rating, but is not as tough as, and is more fragile than, synthetic aluminum oxide. Garnet is the best natural mineral used for woodworking abrasives. Two of its seven known forms are used for this purpose, namely, rhodolite and almandite, the latter being mined extensively in the Adirondack mountains of New York state. When garnet fractures, new cutting edges result rather than dull surfaces. Tempered, heat-treated garnet gives considerably increased work mileage. It is generally less expensive than aluminum oxide and silicon carbide. Garnet is preferred for

Courtesy the Carborundum Co.

Whether it be final hand sanding of hard-to-get-at places or using one of the modern automatic sanding machines proper choice of abrasive materials is a must for minimum cost and maximum quality. Worker is hand sanding with 180-grit silicon carbide, electrocoated open-coat finishing paper.

use with work where heavy filling or burning occurs and long work life cannot be realized.

Silicon carbide is manufactured in an electric furnace by chemically fusing 34 parts of coke, 54 parts of sand, 10 parts of sawdust and 2 parts of salt at temperatures up to 400°F. The sawdust allows for adequate porosity to prevent the accumulation of explosive gases. It has a 9.5 to 9.9 Moh scale hardness rating, has an extremely sharp fracture, and is quite brittle. Its most important uses are in finishing fine leathers, sanding hard finishing materials and soft ductile metals. It is nonmagnetic. Silicon carbide is used in sanding wood with high-speed machines.

Aluminum oxide is produced by treating bauxite in an electric-arc furnace at high temperatures. It has a 9.4 Moh hardness rating, is tough and has good fracture, producing heavy wedge-shaped grits with sharp cutting edges. It is extensively used in sanding wood and metal with high-speed production machines.

Grades of Grains and Backings

Abrasive concentrates are crushed to produce specific shaped grains. The shape of grain varies with the abrasive end product. Two principal grades of grains are produced, non-technical and technical. The non-technical is finer than the heavier technical grain which is heat treated to remove impurities and allow for better bond strength.

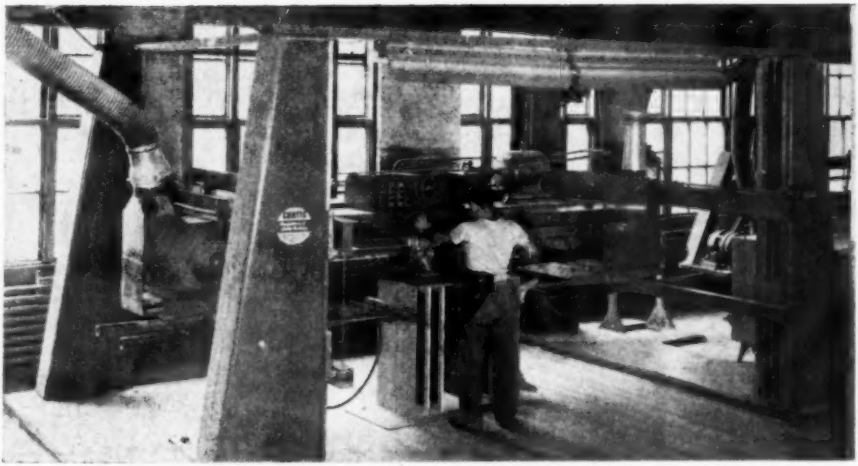
Flint and emery are non-technical whereas silicon carbide, aluminum oxide and garnet are considered technical abrasives. The explanation for this differentiation is that the latter are production tools which must deliver definite work values whereas flint and emery, sold only in sheets, are used for hand operations.

Grains are graded by screening, the screen number indicating the number of openings per linear inch. Thus a screen number of 100 would indicate 10,000 openings per square inch. Technical grain is always specified by using its control screen number, i.e., 180, 150, 120, etc., and occasionally the respective arbitrary "grade" number is given. Non-technical grain sizes are specified only by arbitrary "grade" numbers, i.e., 2/0, 1/0, 1/2, etc. A comparative grain grading chart is shown in Table 1.

The backing materials employed in cutting abrasives are of three primary types: paper, cloth and combinations.

Paper backings for technical grades are made from high quality wood pulp and rope. The five principal weights are 40 pounds (A weight), 70 pounds (C weight), 100 pounds (D weight), 130 pounds (E weight and Y weight). These weights are based on 480 sheets of paper 24" x 36". The 130 lb. paper is the strongest.

Cloth backings produce greater strength and flexibility than is usually



Here is a rough and finish sanding operation on a completed case at the Jamestown Lounge Co. The automatic hydraulic double belt stroke case sander, Curtis Machine Corp., is being used. The machine clamps the case and the entire sanding unit moves forward and back over the surface to be sanded.

posible with a paper backing. Two major grades of cotton cloth are used. "Jeans," known as "J" backing, is a lightweight flexible cotton cloth with uniform strength in all directions. It is used principally where extreme flexibility is more necessary than work value or volume of production. "Drills," also known as "X" backing, is a heavier, stronger and more stretch-resistant cloth which is woven to give greater strength in length than in width. "X" backings are used principally in making production belts, rolls, discs and for sheet goods with the coarser grits.

Combination backings commonly are made by gluing an "E" weight paper with a "Jeans" cloth. They are used for heavier sanding operations requiring strong coated abrasives. Another combination is that of vulcanized fiber combined with "Drills," which is used solely with portable disc sanders where extremely high speeds and maximum stresses are encountered.

Bonding Materials and Coatings

Abrasive grains are held in position by means of animal glues, synthetic resins, principally phenolics, and varnishes for wet sanding. The grits are gravity fed on to the adhesive-coated backing or are electrocoated. Electrocoating is a technique used to align the grits in order to obtain a much higher percentage of upright points. A negative electrode or pole used in creating the electrostatic field attracts the positive end of the grain particle and repels the negative, thereby applying the grain in an upright position on the backing.

There are two primary dispersion-coating techniques which are designated as either "open" or "closed" coatings.

Open coated abrasives do not tend to clog the abrasive surface as easily as the closed type since the surface coverage of the abrasive grain is about 50% to 70%.

Closed or regular coating has an almost complete abrasive surface coverage and is particularly desirable where a heavy rate of stock removal and high working pressures are required.

Table 1.—Classification of Abrasives According to Equivalent Grain Size

Screen Sizes			Equivalent Symbols		
Silicon Carbide	Aluminum Oxide	Garnet	Garnet	Flint	Emery
600	—	—	12/0	—	—
500	500	—	11/0	—	—
400	400	—	10/0	—	—
360	—	—	—	—	—
320	320	—	9/0	—	—
280	280	280	8/0	—	—
240	240	240	7/0	—	—
220	220	220	6/0	4/0	—
—	—	—	—	3/0	—
180	180	180	5/0	—	3/0
150	150	150	4/0	2/0	2/0
120	120	120	3/0	—	1/0
—	—	—	—	1/0	—
100	100	100	2/0	—	—
—	—	—	—	1/2	1/2
80	80	80	1/0	—	1
—	—	—	—	1	—
60	60	60	1/2	—	1-1/2
50	50	50	1	1-1/2	2
—	—	—	—	2	2-1/2
40	40	40	1-1/2	—	—
—	—	—	—	2-1/2	—
36	36	36	2	—	3
30	30	30	2-1/2	3	—
24	24	24	3	—	—
20	20	20	3-1/2	—	—
16	16	—	4	—	—
12	—	—	4-1/2	—	—

By permission from **Sanding and Finishing With Modern Coated Abrasives.** 1945 The Carborundum Co.

What is Flexing

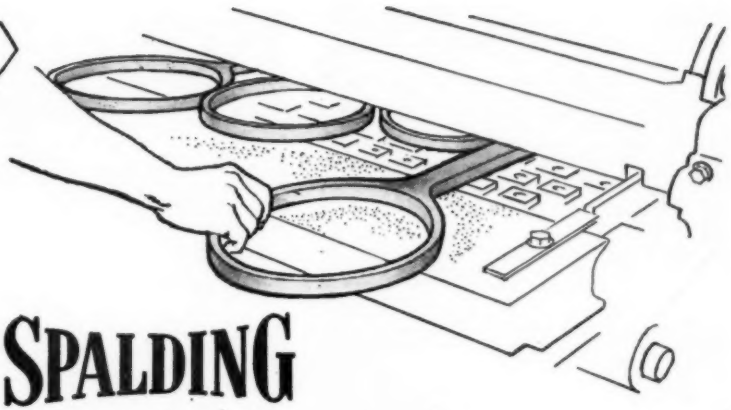
Flexing of coated abrasive products is a manufacturing process which results in breaking the bond bed to yield a product that easily conforms to irregular shapes. There are two types of flexibility derived. One is termed cross-wise flexing, 90-degree flexibility, where the lines of rupture are perpendicular to the length of the belt. This type of belt is commonly employed for flat sanding operations and yields maximum production mileage.

The other type is known as alternate-edge flexing, 45-degree flexibilty, which affects lines of rupture at 45-degree angles to the edge of the belt. Alternate-edge flexing produces a product with maximum flexibility in all directions and is employed in hand sanding and on production operations involving contours or irregular shapes.

The increased use and development of mechanical sanding machines in the past decade has resulted in increased development by the abrasive manufacturers. In keeping with the furniture manufacturers' demands for greater and better-quality production, the uniformity and quality of coated abrasives have been increased. Techniques for uniforming grits have resulted, producing more durable and sharper cutting grains that yield better work mileage.

Grinding, heat treating and grain-separating techniques have been developed and further improvements are being studied. To minimize the effect

JEWEL BRAND GEMS

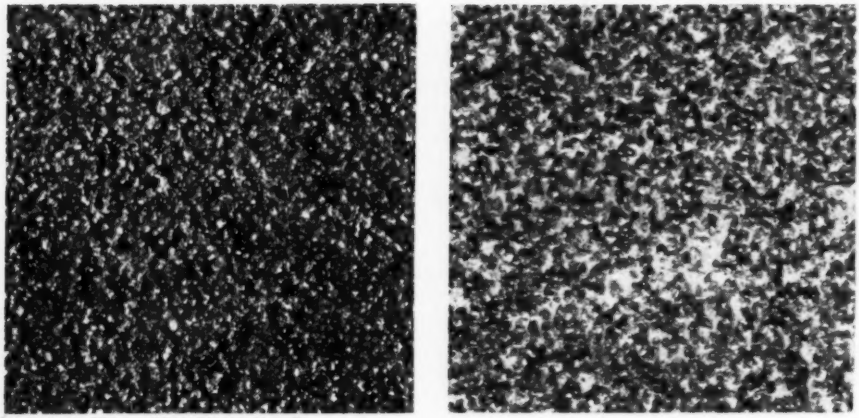


how SPALDING finishes flawless frames for top flight tennis rackets!

Glue removal and the final finishing of top quality tennis rackets used to be a costly production problem at the world-famed A.G. Spalding & Bros. Inc., plant at Chicopee, Massachusetts — until Jewel Brand Abrasive Engineers helped save the day!

Working closely with Spalding production officials, experienced Jewel Brand Engineers were able to select a Jewel Brand Abrasive Belt that not only produced satin-smooth frame finishes in seconds but also reduced costly breakage and splintering to a minimum.

This is just one of many examples of the special knack Jewel Brand Engineers have for solving out-of-the-ordinary finishing problems. Combine the fact that Jewel Brand Coated Abrasives have earned an industry-wide reputation for longer wear plus faster, cleaner cutting and you have the reason why cost-wise manufacturers turn to Jewel Brand *first* for finer finishing. Prove the advantages of this combination for yourself. Call your nearby Jewel Brand Abrasive Engineer or write us direct today. Abrasive Products, Inc., 573 Pearl Street, South Braintree 85, Mass.



Courtesy Clover Manufacturing Co.

The proper choice of open- or closed-coated abrasives can appreciably affect the over-all material and production costs as well as the quality of the finish. The striking difference is well illustrated in these photographs.

of temperature and humidity, phenol-formaldehyde resin glues have replaced animal glue in many places. Other synthetic resins have been and are being screened constantly. Synthetic-base varnishes are used for wet- and dry-coated abrasives to give greater product flexibility and usefulness. Experimentation on backings and combination backings is continuous. Belt cleaning materials have been developed to extend the working life of belts.

Factors Influencing Sanding

The degree of control and quality in kiln drying and machining operations have a direct bearing on the sanding within a given plant. The varying conditions and differences of opinion among sanding operators and supervisors as to the best sanding procedure does not allow a specific procedure to be outlined that meets with general approval.

Generally, the first sanding operation is with a multiple-drum sander. When there is only one, and the machine is used for general work including the sanding of solid stock, glued-up frames and veneered panels, a common abrasive grit selection is 40, 60, 100 or 50, 80, 120.

When sanding veneered panels, the first drum is frequently raised. In plants which do excellent machining, grit sizes 80, 100, 120, and sometimes as fine as 150 on the last drum, are employed. Close-coated garnet, aluminum oxide and silicon carbide paper- or fiber-backed abrasives are used in drum sanding operations.

A polishing belt sanding follows drum sanding in most plants. The automatic stroke sander is preferred for polishing large straight panels, whereas the hand-block sander and lever-stroke machine generally are preferred where there is considerable spotting and for polishing round tops or panels with irregular edges.

Abrasive grit sizes vary considerably on polishing belt operations. When only one belting operation is employed, it is seldom practical to use more than one grit size finer than the last grit on the drum or multiple sander. When two polishing belts are used, the same grit or one grit finer than the last drum is employed on the first belt, and two grits finer on the final belt. The trend has been to increase the speed of polishing belts, but with grits 150 and finer,

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Over one hundred thousand Model 400 National Air Sanders are in use in industries throughout the nation. Their abilities to cut finishing costs, and still give a better sanding job is proven by their continued popularity. National makes a complete line of block sanders for the woodworking industry . . . electric or air driven with either orbital or straight-line action. Write today for a complete catalog.

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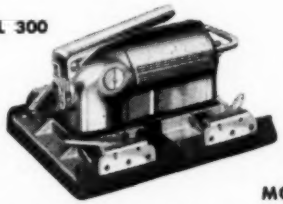
MODEL 300



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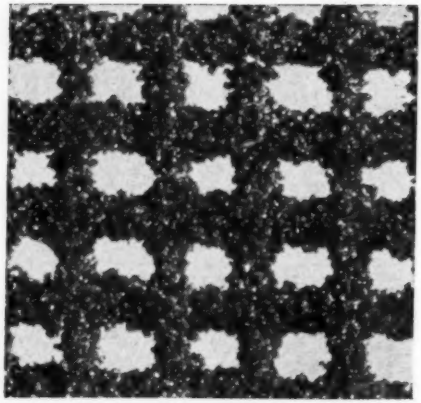
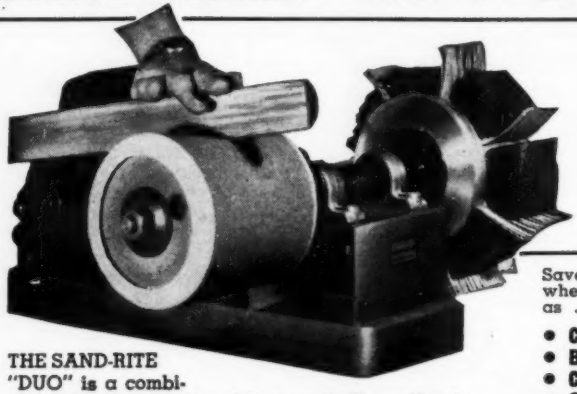


Courtesy Bay State Abrasive Products Co.

Clogging, heating and resultant reduced work value are problems with abrasive papers in many plants. A relatively new type abrasive product, coated on both sides with a wide open mesh to reduce the clogging problem is now commercially available from several manufacturers.

SAND RIGHT WITH SAND-RITE



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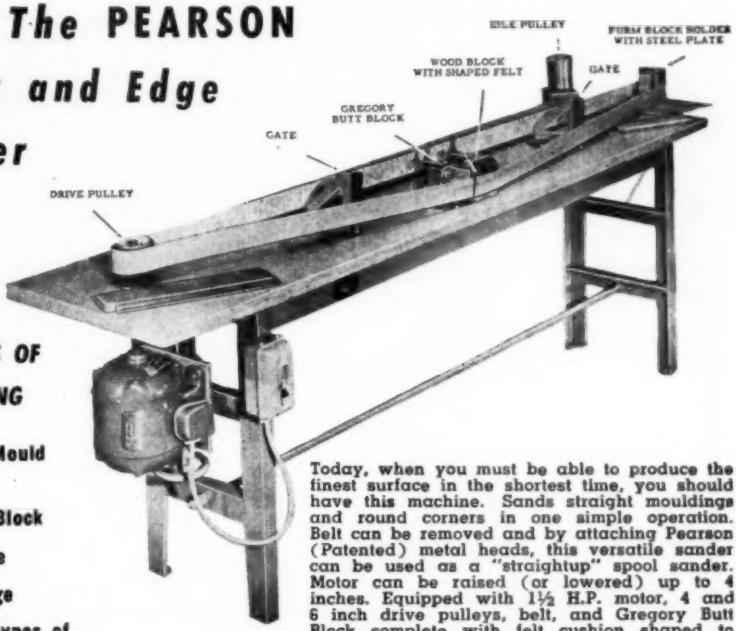

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Today, when you must be able to produce the finest surface in the shortest time, you should have this machine. Sands straight mouldings and round corners in one simple operation. Belt can be removed and by attaching Pearson (Patented) metal heads, this versatile sander can be used as a "straightup" spool sander. Motor can be raised (or lowered) up to 4 inches. Equipped with 1½ H.P. motor, 4 and 6 inch drive pulleys, belt, and Gregory Butt Block complete with felt cushion shaped to fit any one mould. Length of belt is 19 feet; table 24 inches wide. Overall length is 11 feet.

We Also manufacture Scroll and Drum Sanders.

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HIGH POINT, N. C.

considerable burning has been experienced at speeds above 5,000 surface fpm on woods such as mahogany. A wide variety of jobs are done with edge-belt machines using grit sizes from 80 through 120 with an "X" weight garnet or aluminum oxide cloth.

Moldings are sanded with molding belts or with delicate or complicated shapes on spindle machines. Open-coat "Jeans" cloth in either garnet or aluminum oxide in grits from 50 to 120 are commonly used. Molding cloth is used in several different degrees of flexibility depending upon the complexity of the job. Belts are operated between 2500 and 3000 surface fpm since high speeds frequently cause burning and make the belt more difficult to control. Turnings usually are sanded on an automatic turning sander with scored garnet or aluminum oxide papers, with grits

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Today, most plants attempt to deliver parts to the assembly department finish sanded, but a certain amount of hand sanding is still practiced in the cabinet or assembly departments on odd-shaped parts which are inaccessible or impractical to machine sand and on certain types of furniture where joints are flushed after assembly. Garnet close-coat paper abrasives with grits 80 to 150 and finer are used in the sanding to remove surface defects which result from handling. Many concerns are finding it desirable to sand all prominent-face surfaces with one of the several portable machines, using 150 grit or finer, before the furniture goes into the finishing department.

In choosing the most efficient sanding system, several major factors must be kept in mind. First among these is that sanding is a cutting operation. Even the so-called polishing belts should be cutting, for if they are not, a pseudo-smooth surface may result. The subsequent grain raising would be difficult

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to handle even with sizing or wash-coating techniques.

If excessive pressures are employed, considerable heat can be generated which makes the surface wood more plastic and therefore more easily compressible. Besides giving a pseudo-smooth surface liable to excessive grain raising, the uniform penetration of stains and the adhesive qualities of the surface can be adversely affected.

Jumping from a heavy grit to a fine grit is often false economy and requires more actual sanding time than if intermediate grit sizes are employed. In addition, the final quality of the surface may be reduced. An analogy relating to the above practice might be trying to level a series or hills with men, shovels and wheelbarrows rather than starting out with bulldozers and other heavy earthmoving equipment.

Grain raising may be broken down into several surface phenomena. One

of the most important causes is incomplete cutting of vessel segments, pieces of pore walls, which drop into the wood pores and on picking up moisture, swell and attempt to return to their original positions. Therefore, sharp clean cutting is requisite in sanding to minimize grain raising effect. A detailed discussion of grain raising and sizing techniques will be covered later in a separate section.

An additional point, quite obvious, is to employ the heaviest final grit possible for the last sanding operation. In other words, if 120 will do an adequate job, going on down to 150 or 180 may be false economy. In fact, this type of practice may result in a burnished surface that does not have optimum qualities for uniform penetration or adhesion of the finishing materials.

Summary

In summary, it might be well to remember that since sanding is a cutting operation, all factors such as species, size of the cutting tool (grit size), feed speed, pressure and moisture content must be considered if an efficient, economical operation is to be accomplished.

The next articles in this series will deal with the different types of production sanding machines, their use, limitations and advantages.

FLEXIBLE SHAFT SANDER

A portable model "505" sander, manufactured by the Junior Tool Company, Azusa, California, reduces arm fatigue from overhead sanding operations. The new sander is of the "variable orbital oscillating" type, featuring a "flexible shaft" so it can be used in any position—overhead, to the side, at floor level, or in any position customarily used when sanding or polishing.

The model "505" sander is well adapted for cabinet and furniture finishing shops, boat builders, construction jobs, ceilings, walls or other surfaces where awkward sanding positions might tire the operator. By placing the motor in the handy shoulder sling, most of the weight ordinarily found in a portable

sander is shifted to the back. The operator's arm need only support the 2½-pound sanding head in working position. The advantages to the operator are obvious, since less fatigue increases his production. The motor can also be placed on an overhead trolley for production line work or bench work.

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HOW

Part 2

To Select An Abrasive

By C. A. Baker, *Supervisor Technical Service Department, Minnesota Mining & Manufacturing Co.*

THE mineral is the heart of a coated abrasive, and the bond is comparable to "muscles," holding the abrasive mineral in place with its cutting edges properly positioned to do the most effective job. These two coated abrasive components—minerals and bonds—were discussed in an earlier article.

The backing, then, is the backbone of a coated abrasive, determining to a large extent its rigidity or flexibility; giving support to the mineral grains, and supplying overall strength.

There are four basic types of backings used in the manufacture of today's coated abrasives; Paper, cloth, fibre and combination. Each of them has a definite effect on the suitability of a coated abrasive for a particular sanding operation.

Paper backings are made in four weights—A, C, D, E—to accommodate a vast number of hand sanding and machine sanding operations.

"A" weight paper is the lightest and most flexible of the paper group, and is particularly suited for finish sanding and contour work for which finer mineral grits are used.

"C" and "D" weight papers are used by hand or on an oscillating machine in instances in which a certain amount of stock removal is required. Papers in these weights are correspondingly heavier and less flexible than "A" weight papers.

"E" weight paper is the heaviest of the paper group, providing the necessary tensile strength and mineral support for mechanical applications, such as drum sanding and belt operations.

Two types of cloth backings—jeans (J) and drills (X)—are in general use as backing for abrasive belts. The major difference between the two is in the weave and size of thread.

Jeans has a fine thread and close weave, which makes it a backing particularly adaptable to sanding irregular or contoured surfaces where flexibility is a strong factor.

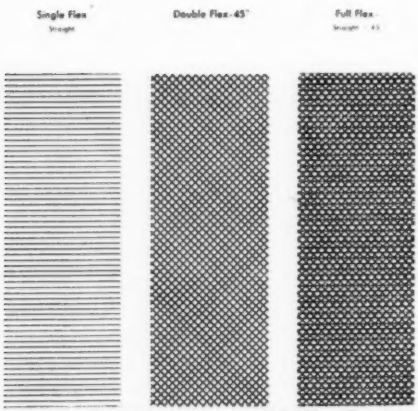
Drills backing is a strongly woven, canvas-type material with a heavier thread, used for operations in which strength of backing is more important than flexibility.

Where extreme toughness is essential, a fibre backing is recommended. Fibre backing is made by combining several layers of rope stock paper and processing them into a relatively hard, stiff material which has more body than any of the other backings.

Combination backings are of two types—cloth and paper, or cloth and fibre—both of which can withstand tremendous shock.

The one used in the woodworking industry is the cloth-paper combination, produced by laminating a thin layer of cloth to "E" weight paper.

In two articles, Mr. Baker has discussed minerals, bonds, methods of coating, backing and flexes in some detail. In his next article he will point out how, with a knowledge of these factors, the right coated abrasive is chosen for a particular sanding job.



Courtesy Minnesota Mining and Mfg. Co.

These are line representations of flexes. The black lines represent the angle at which the sandpaper web is drawn over a round bar. Single flex offers the least flexibility of the three.

This backing is used on jobs for which "E" weight paper alone is not strong enough.

The four general types of backings offer a range of flexibility adaptable to a great many sanding jobs; however, in some instances it is desirable to achieve a degree of flexibility not offered by the standard backings.

Backing flexes are of minor importance when the coated abrasive is to be used on a flat surface; however, flexing is of prime importance on contour sanding operations.

Manufacturers can increase the degree of inherent flexibility in a coated abrasive web by additional flexing operations. Types of flexes are called "single flex," "double flex" and "full flex." Flexing involves running coated abrasives material in various manners over a round bar.

Single flex is the most common type used for paper-backed coated abrasives, and is achieved by drawing the sandpaper straight over the bar (that is, with the edge of the paper at a right angle to the bar). In most cases, if paper backing needs more than a single flex to do a job, then use of a cloth-backed coated abrasive is indicated. Cloth backings are available in all three flexes.

A double flex involves passing the sandpaper over the bar twice at opposing 45-degree angles. This provides more flexibility than the single flex, but less than the full flex.

A full flex is a combination of the single and double flexes, and produces an extremely flexible sandpaper; yet, one which retains the strength of the backing with which it is made.

It is well to remember this: The less flexibility a coated abrasive has, the faster it will cut and the longer it will last. It is always most economical to use the stiffest possible belt that will do the job effectively.

Where belt sanding is involved, the quality of the splice is important. Some woodworking plants make their own splices, and have found that their own techniques are satisfactory.

There are advantages, however, to buying pre-made belts from a coated abrasives manufacturer.

The manufacturer has years of experience in splice making for many industries, and has developed special types of equipment as well as skill and know-how for making smooth running splices—splices which are especially designed for the woodworking industry.

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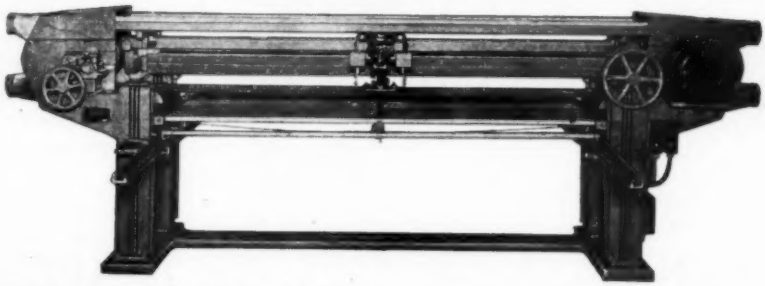

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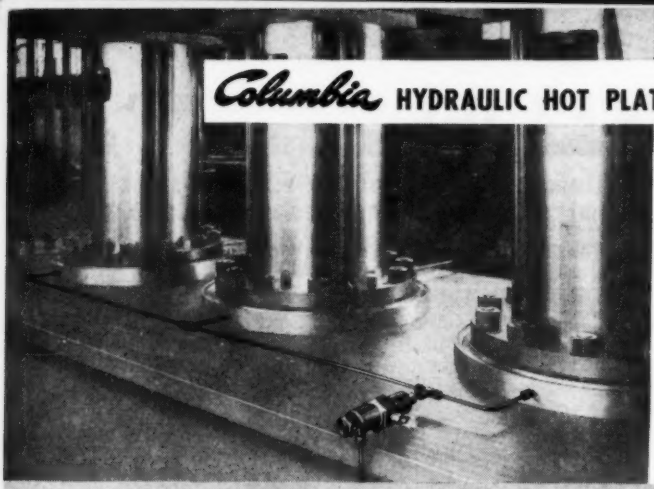

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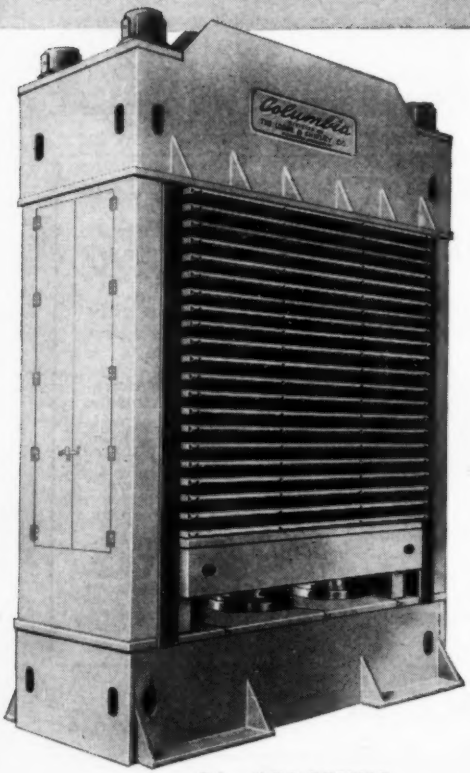

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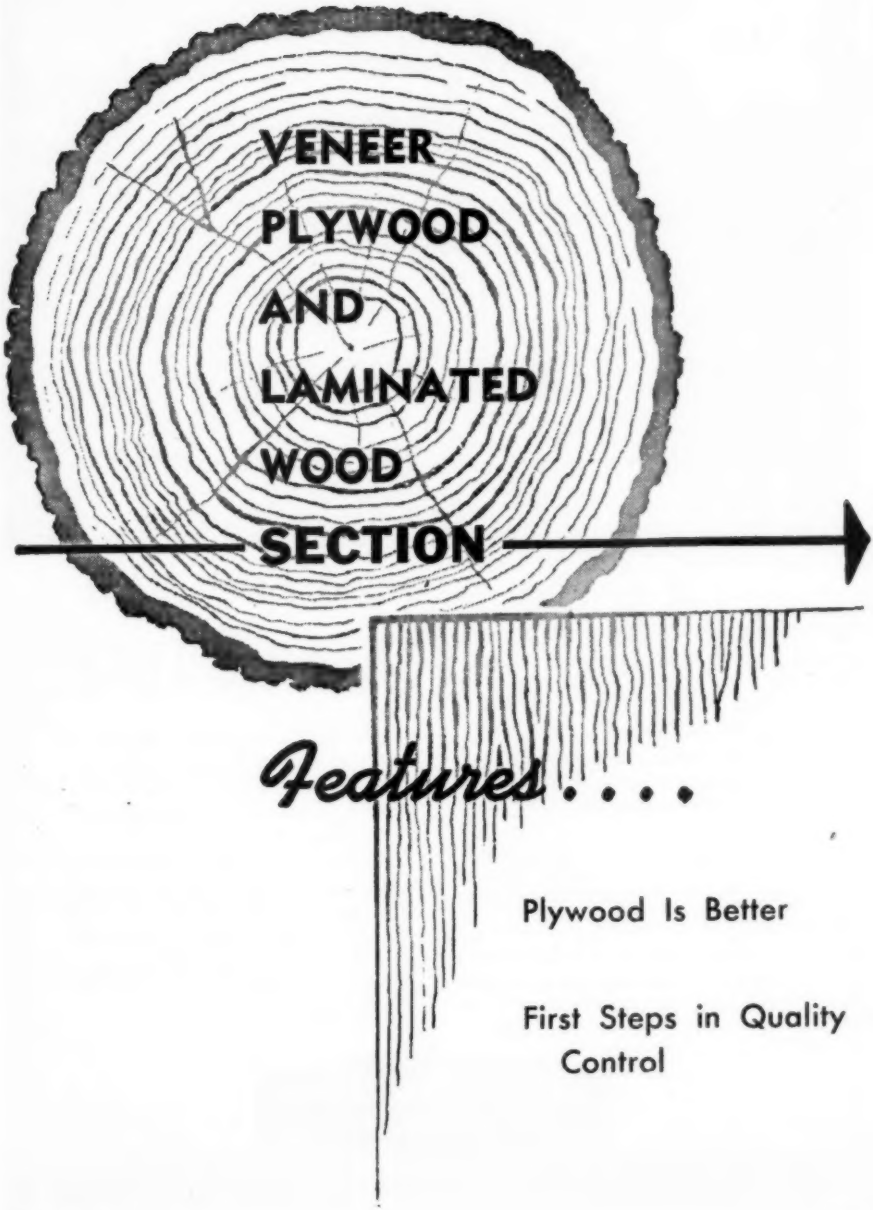

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PLYWOOD

Is Better.... DOES NOT SPLIT

By **Thomas D. Perry**

WOOD, in its normal state, has a tendency to split along the grain. If one is cutting wood for a stove, or a cheery hearth fire, this splitting characteristic may be regarded as a distinct asset. Knotty chunks are very discouraging to the wood chopper, and may encourage more or less violent language. But an examination of a split surface, through the knot, still shows that the line of cleavage substantially follows the grain direction.

In other applications, such as structural utilization and making furniture, this splitting tendency in solid wood becomes a serious liability. Many methods have been devised to lessen or to counteract these hazards of splitting, which inevitably reduce the strength of these wood members. The best of them are only partially successful, and wood still confounds its users by continuing to split.

Obviously, since the structure of wood is a series of minute overlapping cells, arranged in relatively parallel directions, its maximum strength will be along the grain. These cells, or fibres, are knit together lengthwise, but their sidewise cohesion is usually rather slight, and cleavage, or splitting, readily occurs. In certain species, of which Tupelo gum is an example, the grain is more or less twisted and interlocked so that splitting is less likely to be a problem. On the other hand, in oak, there are pronounced radial cells, which give the flake appearance to quarter sawn or quarter sliced oak. These radial growth cells usually facilitate splitting, even in such dense woods as the many varieties of oak.

Splitting in Large Timbers

One of the practical ways to reduce splitting in large timbers is to pre-bore holes for screws, bolts, rods and the like, a rather costly process, but usually justified. This eliminates the start of the split, but the shearing along the grain, in front of the metal fastener, when stresses are imposed, as on a truss or girder, still leaves this splitting tendency as a liability.

A further procedure, in large timbers, is to use what are called ring connectors, some 3" to 4" in diameter, set in circular grooves around the bolts. This, again, adds to the strength, as potential shearing, along the grain, under heavy loads, is distributed over a much larger area. At best, the sidewise strength of the wood is still far less than its lengthwise strength.

Splitting Due to Nailing

Structurally speaking, the splitting of boards, due to nailing, has always been a problem and no one has found the answer. With care and "know-how" an experienced workman will minimize this splitting and develop fair strength in a nailed joint. However, even in the light of centuries of experience, driven nails and screws continue to push wood fibres apart along their weakest line, often to an extent where splits are inevitable. This trend is always more pronounced near the ends or edges of boards. Pre-boring of holes is only a

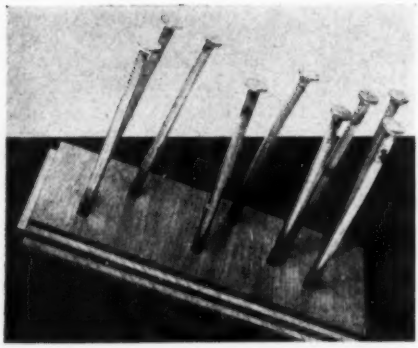

Fig. 1. Plywood flooring, ⅝" thick x 3" long. Spikes, 60 d., driven without pre-boring. No splitting could be detected.

partial answer, but in a large percentage of cases it is impractical and its cost is prohibitive.

Plywood Does Not Split

Laminating thin layers of wood, such as veneer, into plywood is the best answer, but it is not a universal solution to the problem of wood splitting. Many wood products, from their very nature, must still be made from solid wood, and splitting will continue to be a serious limitation. However, in applications for which plywood is suitable, the several cross layers do neutralize this normal splitting tendency which is so characteristic of solid wood.

In plywood constructions this potential separation of the fibres is still present, but it is almost entirely offset by the firmly glued adjacent layers of veneer. The end grain of one layer is rigidly attached to its neighbor, which is side grain, and the same is true in reverse. Not only is it relatively easy to drive nails, brads and screws through plywood without splitting, but there will be no subsequent splitting when these mechanical fastenings begin to carry their load. This is particularly true near the edges and ends of the plywood units, where the application of mechanical fasteners is most critical. It is therefore obvious that fewer nails in plywood will be necessary to do the same service that would require more nails in solid wood.

Plywood Flooring

The photograph used in Fig. 1 is highly dramatic, since no one would dream of face nailing hardwood plywood flooring with six penny spikes. However these very large spikes were driven through this short (3") section of ⅝" plywood without pre-boring, and there is no splitting whatever in evidence! It requires only a bit of imagination to predict what would have happened if the same spikes had been driven through a piece of solid oak flooring of the same length and thickness.

From a practical standpoint, such plywood flooring is machined on its edges with a tongue and groove design. It is then "toe-nailed," on an angle, through the tongue, as is indicated in Fig. 2. The nail heads are "set" below the surface of the tongue, so that no nailing is observable on the finished floor. In the upper sketch it is to be noted that the lips of the grooves have two plies, while the tongue consists of one full ply and parts of two adjacent plies. This is a marked improvement over solid flooring, where both the

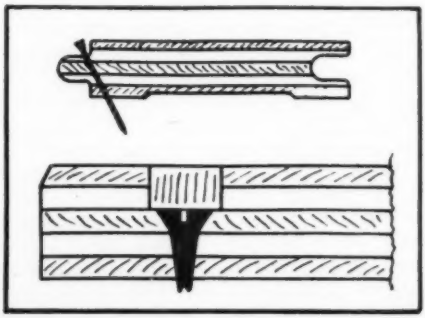

Fig. 2. Concealed nails and screws in plywood flooring.

tongue and lips of the groove are easily split off in careless nailing, or in subsequent service.

Plank flooring, in random widths, which is an excellent colonial design, is preferably made of plywood and plugged to conceal screw heads, as is shown in the lower sketch of Fig. 2. "Butterfly" connectors are often similarly inserted to splice units together, but are essentially decorative in character. The several laminations of the plywood protect such plank flooring from splitting and increase the holding power of the screws.

Plywood Wall Paneling

The sketches in Fig. 3 illustrate several of many methods of recessing the edges of 3-ply and 5-ply plywood for its installation as wall paneling. While some prefer a square butt joint between the plywood panels, with two rows of nails that must be concealed, or partially so, most architects prefer to employ some type of groove or rabbet, either with or without a covering strip. If the panels have concealed nails to hold them in place against the studding, the attachment of the covering strips may be made with glue, or by a very few small brads, or by both. This is much less conspicuous than the direct nailing. It should be noted that all edge projections are at least one and one-half plies thick to guard against splitting.

Concrete Form Plywood

Large quantities of fir plywood, preferably pre-oiled, are used for concrete forms, where the smooth surfaces are much more satisfactory than the conventional construction with tongue and grooved boards about 6" wide. Here the non-splitting quality is important, since it permits close edge nailing and facilitates taking down forms that have served their purpose. There is a minimum of damage in removing the edge nails, far less than in solid lumber, and plywood forms can be re-used many times. Some authorities advocate trimming off the nail holes before re-use, but many find it unnecessary, except where unusual smoothness is required in the concrete faces. If not required for subsequent form work, the once or twice used form plywood will be found to be acceptable for subfloors or sheathing.

Doors for Kitchen Cabinets

Similar non-splitting advantages occur in the use of plywood for kitchen cabinets, where the doors or drawer fronts are recessed to cover the joints in the framework. Illustrations are shown in Fig. 4. The plywood lip, consisting of three layers of veneer, provides a sturdy extension that cannot split off, even under severe abuse. The recessed back, in the lower sketch, provides a lighter and cheaper door that is less likely to sag than the thicker door above. One ingenious manufacturer is said to have put guard strips across this door frame, providing a convenient

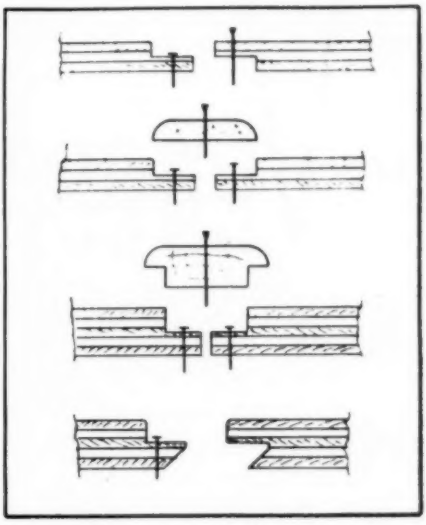

Fig. 3. Edge joints in plywood wall construction.

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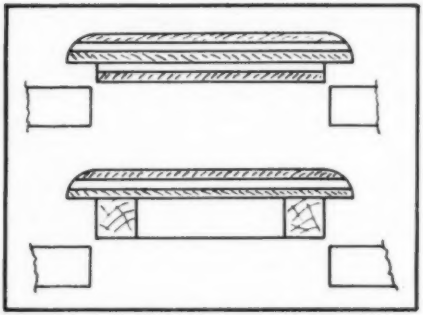

Fig. 4. Plywood lips cannot break off by splitting. Upper: recesses in solid plywood. Lower: plywood glued to frame.

space for paper napkins, cook books and recipe cards.

The drawer front, with recessed edges, is not illustrated, but is similar to the upper sketch, with drawer sides attached to the front.

Panel Doors

There is another aspect to the problem of splitting that is overcome by plywood. Take the case of the paneled door, two types of which are illustrated in Fig. 5. Panels of solid wood, (upper sketch) whether they are long and narrow, or short and wide, present two hazards: (1) shrinking and (2), splitting, sometimes both.

As shrinking occurs the panel will either withdraw from its groove, or if fitted too tightly, will split apart. Withdrawal from the groove means an unsightly exposure of the edge, and a split in the panel is an even more serious defacement. If such a door panel is of plywood construction, (lower sketch) shrinking is eliminated and splitting is prevented.

Panel doors, exposed to heavy duty, such as in factories and warehouses, will give longer service if the panels are of plywood. The sharp impact of the corner of a heavily loaded truck on a door panel is not an unusual event.

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If the panel is of solid wood, it will eventually split or break under such abuse. If it is of plywood, the cross grain of the adjacent layers will provide toughness and resistance that the solid panel cannot have. There will be no splitting in the plywood panel, even if the wood is shattered.

Curves Without Splitting

Solid wood can be curved to a moderate degree, and no more, especially if steamed and set between rigid and heated forms until it is dry. Splitting and breaking are ever present hazards when attempting to bend solid wood into curves.

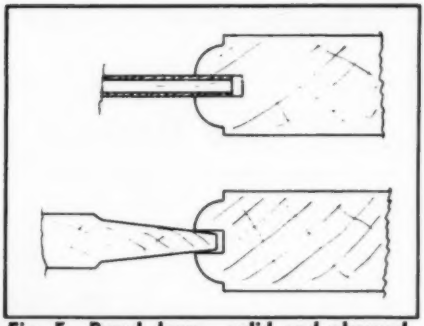

Fig. 5. Panel doors—solid and plywood.

On the other hand, curves in plywood can be far more successful, due to the restraining influence of the adjacent layers. This phase of the non-splitting quality of plywood is reserved for the succeeding article in the next issue of WOOD WORKING DIGEST.

A Simple Experiment

In spite of all that has been written on the subject, there are still many who continue to doubt the non-splittable quality of plywood. For such doubters, a very simple home experiment can be very convincing. Most "do-it-yourself" shops accumulate a considerable amount of unusable odds and ends, that are waste and only suitable for kindling in the fire place. Among them will be some chunks of discarded plywood. Try to split them into kindling wood with a hatchet. A few tries will be more convincing than thousands of words! In 99.44% of the cases the battered, but entire chunks of plywood will be consigned to the fire, with no sign of splitting!

The man who is on the right track can still get runover if he merely sits there.

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First Steps In Quality Control

By J. M. Juran

Consulting Management Engineer

A SUCCESSFUL program of quality control must start with a listing of what are the quality problems of the company, in their order of importance. Unless such a list is prepared, there can be no agreement on what direction a program should take.

To generate such a list, key people from several departments, i.e., sales, production, design and finance (and others if appropriate) should get together with a blackboard and a skilled discussion leader. Each man has his say on what are the important quality problems, and this is to go on the board without challenge.

When the round is complete, there should be a discussion on what is meant by the different problems. Some things will be subdivided, others will be combined. But there will remain perhaps 50 listed quality problems.

These should now be arranged in their order of importance. This can be done by listing them all on a sheet of paper and asking each man to write the number 1 opposite the problem he regards most important, 2 opposite the next most important, etc. The sheets are collected and the numbers added up. The problem with the lowest total becomes, by the democratic process, the most important, and so on.

By now the group has taken the important steps of listing its quality problems and arranging them in order of importance. The general nature of the program can now be agreed on. A real fork in the road must now be faced. Looking at the top dozen problems, there must be answered the questions:

Do we have the facts needed to solve these problems?

Can our regular supervisory organization collect and analyze these facts or do we need a separate man to do this for them?

The answers to these questions decide whether there is need for a quality control department or not.

In general, if the main problem is to "hold the status quo," i.e., keep performance going at the historical level of results, then the regular supervision can do the job. If, however, the main problem is to change the status quo, i.e., to arrive at a different (better) level of performance, then usually a separate department is needed to collect and analyze the new facts. Without new facts such a change in performance is not possible in any short time.

If a separate department (sometimes called a quality control department) is set up, then the job of that department is primarily to generate the new facts needed to point the direction for solution of the main quality problems. (These have already been listed by the method described above.)

The need for a separate quality control department stems from the fact that a really thorough analysis requires:

(a) Uninterrupted time to conduct studies and to follow trial lots if need be.

(b) Mobility, the freedom from assignment to a specific department.

(c) Perspective, to view the problem based on the overall company economics rather than from the narrower economics of one department.

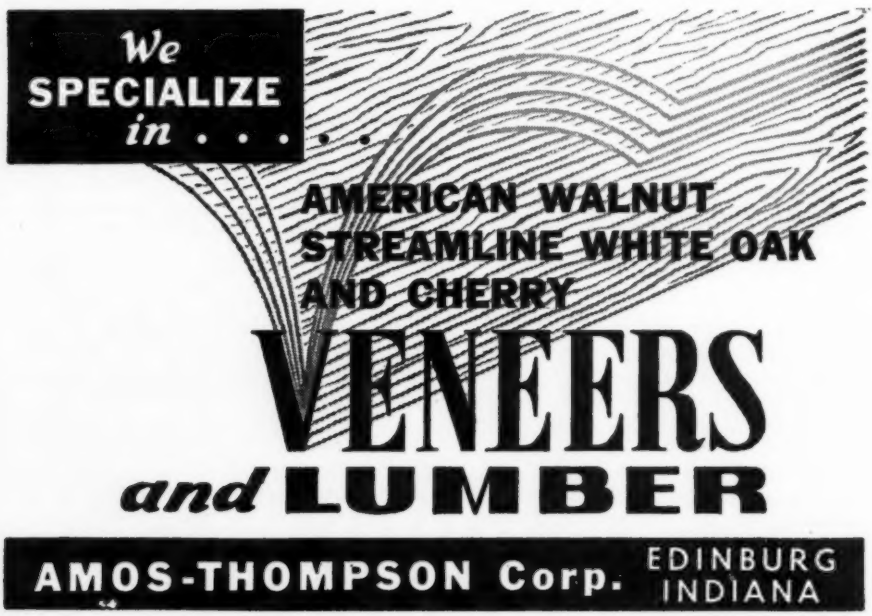
(d) Open-mindedness, without the inertia which comes from a vested interest in the existing order.

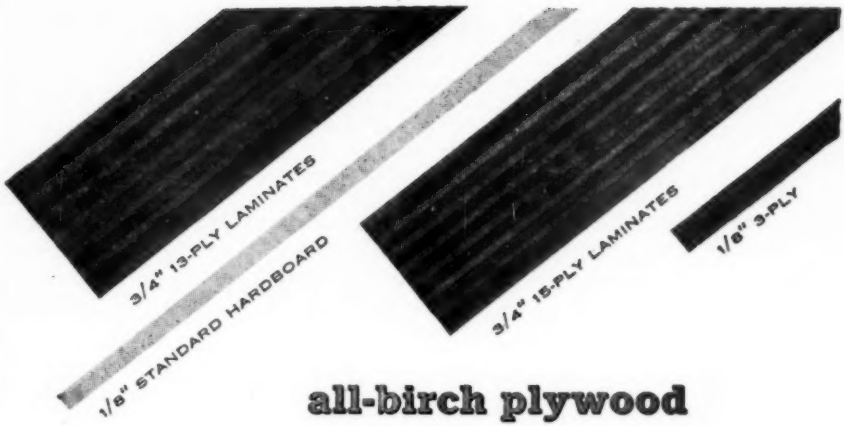
(e) Analytical skills, to know what kind of data to collect, how much, and how to get conclusions out of the data.

These things—time, mobility, perspective, open-mindedness and analytical skills—are not possessed sufficiently by a line department supervisor. They must be supplied, if really needed, by a staff engineer.

The basic solution to quality problems is defect prevention, and this must ever be the prime objective of all who are on the periphery of the quality problem. For the quality control department this means that the basic job is to generate the facts which show what really causes defects, so that the other departments can then act on these new facts.

In an old industry (and woodworking is one of the very oldest) new facts and ingenious analyses will not of themselves produce remedies. The old plant, the old process and especially the old-timer, are covered with long-standing beliefs which do not change easily. The men who are expected to change must be a party to the investigations at the very outset. They must be asked to state what they think causes the defects. The main cause is almost always to be found due to one of the many shop theories. (The trouble is that we





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don't know, to start with, which shop theory is right.)

The shop people must also be a party to the plan of investigation, so that they have a sense of participation, and in this way have confidence in the answers (which they have helped find.)

The need for sticking to the objective of defect prevention is vital. So is the need for shop participation. The man to head up such a quality control program must have managerial competence more than technical competence. A study of success and failure of quality control programs in 39 companies disclosed that no amount of technical competence of engineers could make up for managerial failure to spell out a program in advance, to concentrate on defect prevention, and to secure a high level of shop participation and cooperation.

Edith: "Dick, dear, your office is in State Street, isn't it?"

Dickey: "Yes, why?"

Edith: "That's what I told papa. He made a funny mistake about you yesterday. He said he'd been looking you up in Bradstreet."

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AMI SOLVES HUMIDIFICATION PROBLEM

AMI, Incorporated, Grand Rapids, Mich., manufacturer of coin operated musical instruments, reports excellent results from the first full year of operation of a combination heating and humidifying system which they installed to improve production and reduce waste in their cabinet manufacturing and panel storage areas.

Construction of a new addition, housing panel storage, machine, assembly, and finishing facilities for AMI's attractively designed juke boxes, was completed in 1953. The area humidified embraces the panel storage and cabinet manufacturing areas, with finishing taking place in an adjacent room having a completely conveyorized system.

The various characteristics of the room, plus the combination of storage and production facilities in one area, demanded thoughtful consideration and careful selection of equipment. In addition, several requirements set up by management played a large part in design of the system.

The storage and production area is housed in a single room of trapezoidal shape, 96′ long, 88′ wide at one end and 52′ wide at the other. Over-all ceiling height is 11′-10″, with clear height reduced to 9′-8″ by open web trusses located on 48″ centers over the entire area. Because of the relatively low clear height under the trusses, it was felt that the heating and humidifying equipment should be located in the space between trusses so that it would be mostly above the bottom truss cord.

The angular sidewall has two large doors opening to a covered shipping dock. The doors are opened only for short times and at periodic intervals, but demand particular attention from a heating standpoint to assure an adequate supply of heated air in the immediate vicinity of the doors when they are opened.

About one third of the floor space is devoted to storage of plywood panels and dimension stock for the cabinets. The balance of the room is devoted to machine and assembly areas where stock is cut, sanded and assembled. Approximately 70 detailed pieces go into the cabinet itself and the longest panel is approximately 52″ in length. The dual purpose nature of the room, one end being used for storage and the other end for machining and assembly, required two separate control points.

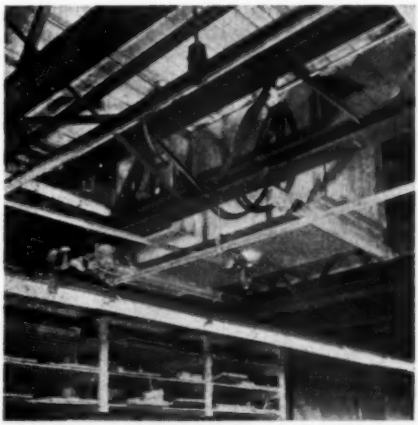

Fig. 1. One of six type BA-1 humidifiers at AMI, showing how it is suspended between the trusses. Service panel and backwashing hose on side of unit provide for easy maintenance.

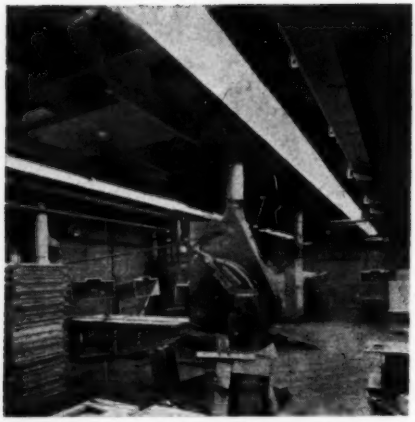

Fig. 2. The machine and assembly area at A M I, showing relatively unobstructed space overhead as allowed by installation of the Bahnson humidification and heating system. Note one unit in trusswork in foreground, another near rear door.

A M I wished to maintain close regulation of temperature and humidity to keep tolerances very close in the machining operations. An optimum room condition of 40% relative humidity at 70 to 74 degrees F. was decided upon, so that an average EMC of 8% could be maintained.

Machinery in the area exhausts, through the dust collector system, approximately 12,000 cubic feet of air per minute, a relatively high rate for a room of this size. Because this high rate of exhaust required considerable heating as well as humidifying capacity, it was determined that combination equipment which could provide both functions would be less expensive and less bulky in the relatively small room.

Conveyor openings to the adjacent finishing room had to be considered, since it would be undesirable to have dust-laden air from the machine room carried into the finishing room through these openings. For that reason, it was felt best to carry a negative pressure in the room so that there would be a constant flow of air from the finishing room through the machine room and out through the dust collector system. No make-up air units were used in the room itself, it being assumed that air supply for the exhaust system would be made up from the finishing room and from infiltration through doors and openings along the outside wall and partitions between this room and adjoining rooms. To prevent cold drafts from the leakage supplying the make-up air, it was felt advisable to sweep all walls with heated air.

In addition to these considerations, the room was constructed to be a temporary location for this department. This meant that heating and humidifying equipment selected had to be unitary in nature so that it might be moved to a new location at a later date without excessive cost.

How all of these conditions were met with standard equipment normally

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available to woodworking plants is an interesting story; one which demonstrates the availability of good humidification equipment for almost every application. It also shows the advisability of the management of woodworking plants telling humidification engineers all of their problems so that the proper equipment may be determined.

The system finally selected to meet all of these unusual conditions and to produce the desired results includes six Bahnson type BA-1 humidifying and heating units. Each unit consists of a rectangular metal cabinet containing a fan, a centrifugal evaporator to atomize ordinary city water into an extremely fine spray, a chamber where the air and spray are thoroughly mixed, and a section of 4 inch thick corrosion resistant filter-eliminators which remove all dirt and all water droplets from the delivered moist air. The air leaving the unit passes through a grille which has wide adjustable blades for accurate control of distribution. Attached to the intake of each unit is a steam heating coil so that the units function as the heating system for the room in addition to humidifying. A service panel on the side of each unit contains electrical and water line components so that all service connections are relatively simple to make. In addition to the steam supply and condensate return for the heater, each unit requires only a ⅜" cold water supply line, drain, and electrical connection for the single ¾ hp motor.

Being approximately 40" wide, 75" long, and 28" high, these units fit snugly between the trusses as shown in Figure 1. The units are suspended from the trusses by means of steel channels welded directly to the bottom of the humidifier chamber. The characteristics of this unit are such that it blends the heated and humidified air to deliver moist air at somewhat above room temperature. This eliminates blasts of hot

Fig. 3. A completed Model F-120 recorded music instrument as manufactured at A M I, Inc.

or cold air and provides extremely uniform conditions throughout the room. Since the humidifying apparatus delivers its moisture in the form of nearly saturated air rather than mist or spray, the units were located between the trusses without danger of depositing moisture on any of the trusses, bus duct, lighting fixtures, pipes, conduit, or other obstructions which are located at or near the level of the bottom of the trusses to keep the working area clear. In one instance, an air line runs within 6" of the front of the unit, yet there has been no deposit or condensation of moisture on this line or anywhere else in the room.

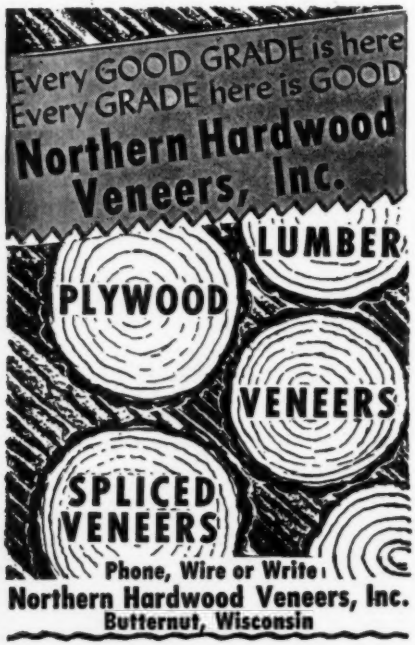
To assure an adequate supply of heated air in the immediate vicinity of the dock doors, auxiliary heating was provided by placing a vertical flow unit heater just inside each door. A thermostat for the control of each heater is located immediately beside the door so

that as soon as the door is opened, the thermostat senses the cool air and turns on the unit heater.

Temperature and humidity control within the room is split into two control zones. A sensitive humidistat in each control cabinet regulates solenoid valves in the service panels of the three units in that zone. A room thermostat at each control station regulates a motorized valve in the steam line supplying the heaters of the units in each zone. Steam coils are of non-freeze construction with copper tubes and copper fins.

All units recirculate room air rather than take any outside air in order not to destroy the balance in air flow which prevents machine room air from passing through conveyor openings into the finishing room. Each unit handles approximately 2000 cfm of air, but the large distribution grille area reduces delivery velocity to the point where no drafts are experienced at the working level. This prevents blowing of sawdust around the room. In addition, full filtering of all air handled is provided by the filter-eliminators in each unit.

In addition to meeting all of the operational requirements, this particular type of unit has proved to be easy to maintain. The single motor in each unit requires lubrication only once a year. To keep the filter-eliminators from loading up with dirt and sawdust, which would cut the efficiency of the units, provision is made for simple "backwashing" of these filters. At the service panel on the side of each unit is a valve with an attached length of hose. When filter cleaning is required, each month or so, a workman merely climbs up to the unit, takes out the removable core in the distribution grille and, with the hose, washes all accumulation of dust and dirt from



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the filters back into the unit where it is drained away immediately. The grille core is then replaced and the hose left hanging on the side of the unit. Heater sections are blown out with compressed air at intervals as required, although their construction is such that they do not tend to clog. In the first year of operation, it has been noted that accumulation of sawdust on the heater and filters is extremely small, so that maintenance has been at a minimum and is expected to be extremely light.

Each of these units is manufactured, tested, and shipped in completed form. Should the equipment be moved, as was originally planned, it will be a very simple matter to disconnect the service lines and reinstall the units in any other location.

Reports on the operation of the equipment have been quite satisfactory. Panels and dimension stock are conditioned for approximately 30 days in the humidified storage area to assure uniformity. The desired EMC of 8% has been maintained so that general tolerances are 1/32" for profiling and 1/64" for pilot holes, unusually close for woodworking. Warping and checking have been prevented, while the thorough conditioning of all parts in the properly humidified atmosphere has allowed assembly to be achieved without misfits or glue troubles. Figure 2 is a general view of the machine area of the room, with several of the cabinets in nearly completed form. Note that the two heating-humidifying units in this area of the room are virtually invisible in the photograph because they are fitted snugly between the trusses above the level of the lights.

Relative humidity is closely checked and has always been found to be within 1% of the desired 40% level. As a result, the wood remains dimensionally stable and such difficulties as "upend-

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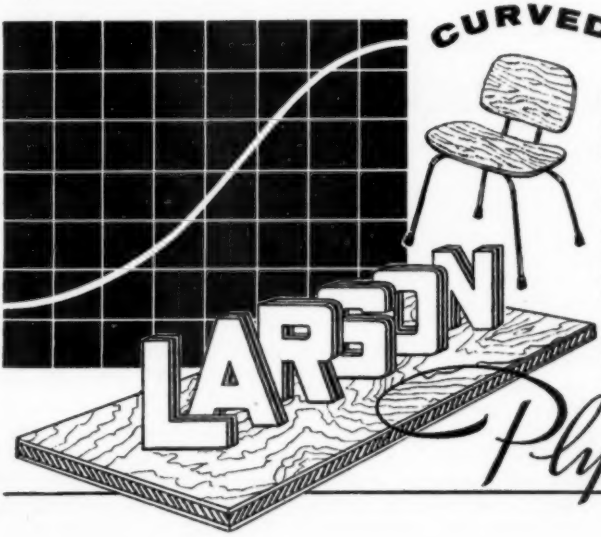

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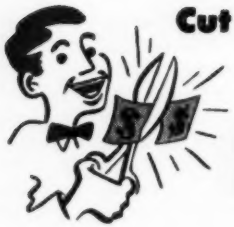

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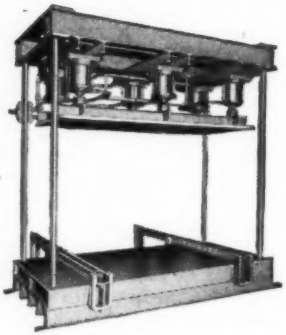

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ing" of panels has been completely prevented.

Figure 3 shows one of the handsome cabinets manufactured at this plant and shipped throughout the world. The contemporary design and use of fine veneers certainly demonstrates the intrinsic beauty of fine woodwork.

This combination heating and humidifying system, selected to meet very specific requirements and demanding characteristics of this room, has been quite successful and is proving that in certain instances the slight additional cost of this particular type of "moist air" humidifying equipment is of considerable advantage. It also demonstrates the advantages of combining the heating and humidifying functions in one system. One of the first installations of the Bahnson type BA unit in woodworking plants, this system has proved that the special characteristics of this equipment combined with heating, full filtering and simplified maintenance, are all of advantage to the woodworking plant.

You can fool all the people some of the time, but you can fool yourself all the time.

SAFE – GUARDING MACHINE OPERATIONS

By Ruddell Reed, Jr.

Professional Engineer and Assistant Professor of Industrial Engineering, North Carolina State College, Raleigh, N.C.

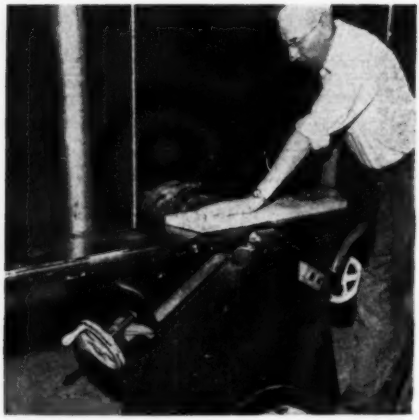
RESEARCH statistics indicate only 10-15% of all industrial injuries are caused by mechanical hazards. These figures are often quoted as an excuse for a poor machine safe-guarding program. These figures, however, fail to emphasize that within a manufacturing activity using large numbers of machines, the injuries due to machine operation are usually much higher than 10-15%.

A recent annual report on industrial accidents for Illinois, prepared by the Illinois Department of Labor, shows that, for all industry, machines are responsible for only 12.7% of compensated injuries. However, in manufacturing, which was responsible for 47% of all injuries, 21.7% of the injuries were due to the machines. This means that manufacturing was responsible for 81% of total industry machine injuries. Perhaps even more significant than these figures concerning frequency, is the severity of machine injuries. If we assume that death and permanent disability, as compared to temporary type injuries, can be used as a measure of severity, we may use figures based on compensation cases closed by the Workman's Compensation Board of New York to illustrate the severity factor. This study shows that, for all industrial injuries in one year, death and permanent disabilities resulted in 32.6% of the cases. However, for injuries resulting from machinery 55.8% were either fatalities or permanent disabilities. This is a severity increase of 71% above the rate for all agencies.

If these figures may be taken as representative, the next question should be, "What can we do about this high injury and severity rate from machines?" Of course, the answer is in the program and procedures established by any particular firm.

Provide Machine Guards

The most effective program is to provide mechanical guards which will prevent personnel's being exposed to po-



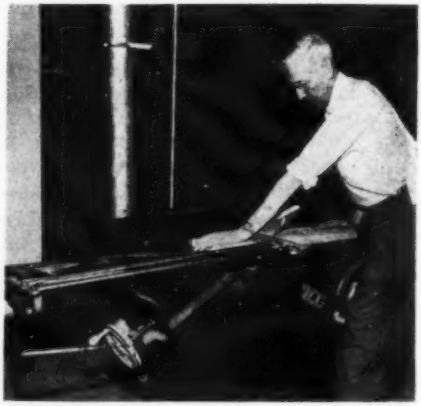
Jointer without guard: in facing stock, if the jointer kicks the stock out from under the operator's hand (which occasionally happens), the operator's hand can easily go down onto the cutterhead, resulting in loss of fingers or permanent functional impairment of the hand.

tential injury. Too often, it is assumed that if guards provided by the equipment manufacturer are maintained, sufficient safe-guarding is provided. This, however, is usually false. Even though machine manufacturers are providing more and better guards, too often they must produce an item within the price range of their competition. This in turn, means that they may sacrifice some guard for price consideration, since all too frequently net price is the major basis for the purchase. Many machine producers price guards as accessories to allow the lower basic price.

To illustrate this lack of guards on purchased machines, a large manufacturing firm in North Carolina recently made a guard survey of its equipment, and, after the survey had been almost completed, they had not found a single machine which they felt was properly and sufficiently guarded. The survey was carried out under the supervision of a safety specialist with the assistance of the foremen and supervisors. This company already had an outstanding safety program and safety record. If such a situation could arise in a plant or company with a proved safety record and background, what would an equally conscientious group find in plants with a less effective safety program.

Without guards, no safety program can be successful, since the environment is not conducive to maximum results. The first step, then, is to see that proper guards are provided for all machines. The best time to do this is before the machine has been put into actual operation. The following procedure can be used to improve this initial guarding.

First: Allow the safety director, or other active safety personnel, to check all purchase orders and specifications for equipment, to see that proper and sufficient guards have been provided.



Jointer with Proper Guard—Facing Stock: in facing stock, if the jointer kicks the stock out from under the operator's hand, his hand comes down on the guard instead of the cutterhead. Result, a bad scare but no injury. Guard has adjustable spring tension to offset weight of the guard. As stock is fed on the bed of the jointer, the front end of the stock hits the tapered face of the guard and raises it easily with minimum interference with the actual operation.

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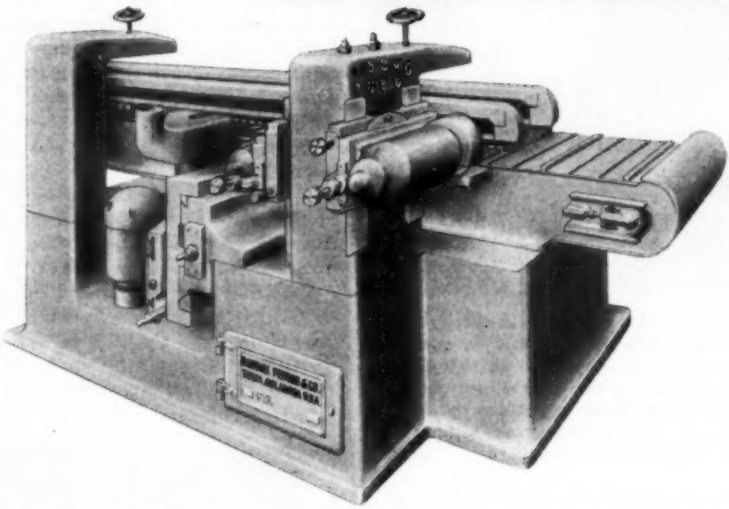

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Shaper without guard—shaping on a form against a dead collar: in case the operator's hand slips, or if the shaper kicks the stock, the knives are exposed and there is nothing to prevent the knives taking off a few fingers or ruining the whole hand for future use.

We cannot expect the purchasing agent, or requisitioning authority, to be fully qualified on safeguarding techniques, any more than for detailed design. Therefore, an expert should be consulted.

Second: If it is not possible to purchase sufficient guards from the supplier's stock list, then steps should be taken to obtain them by special order from the supplier, from a guard specialty shop, or to develop them within your own shops. This should be done prior to the arrival of the equipment, so that all guards may be included in the initial installation.

Third: When the method for operating the equipment has been developed, it should be discussed with the safety specialist to be certain that all safe practices are followed, and guards used properly. If some difficulty arises, it may be necessary to alter present guards, use additional guards or change the method. In no case should a guard be eliminated or reduced to the extent of not providing sufficient protection.

Fourth: Before the equipment is placed in operation, it should be inspected and approved by safety personnel.

Regardless of the person making the guard analysis (whether he be in design, methods, safety, or other department) the following sequence of analysis should be followed:

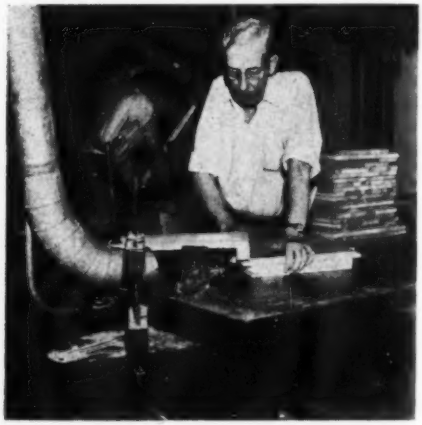
1. Can the unsafe operation be eliminated?

2. If not, can the hazard be relocated to such an area of the machine that the operator, or other personnel will not come in contact with it?

3. If not, can the hazard be guarded to reduce the possibility of injury?

4. If not, can the risk be reduced by guarding the operator, by use of protective clothing or equipment?

5. Regardless of which, or how many



Shaper with guard—shaping on a form against a dead collar: the guard completely covers the knives and extends beyond them, making it almost impossible for the operator's hand to get into the knives. Guard in the picture is homemade but guards on similar principles can be bought. Guard also acts as a spring hold down for the stock. No interference whatever with convenience of operation.

of the first four are applied, what operator training in safe practices is required?

In the case of machines and equipment already in operation, the problem is more difficult to analyze and solve. Installed equipment requires that inadequate guarding be determined by inspection and this is often difficult, since the various persons concerned have become accustomed to prevailing conditions. It frequently is difficult for the plant inspector to determine inadequacy, and even harder to sell foremen and operating personnel on the need for guards or other protective devices. The latter is particularly true when it seems to involve a change in manufacturing method which operating personnel believe will reduce their volume of production as it affects earnings.

Use of Guard Inventory

It may be possible to overcome this resistance on part of the operators by use of a guard inventory. An inventory form can be prepared and issued to operators, requesting them to make suggestions as to how the safety of their particular machines may be improved. This has the advantage that it offers the operator a chance to share in the responsibility and, thereby, helps to

MACHINE GUARD INVENTORY

Name _____ Date _____
Department _____
Occupation _____
Machine or Equipment Used by You
_____
_____
_____
_____
_____
Machine No. _____
Type of Guards Provided _____
Are Guards in Good Working Order? _____
If Not, Explain _____
Are You Sufficiently Guarded From:
Tools or Cutting Edges _____
Work _____
Moving Parts _____
Belts _____
Dust _____
Chips _____
If Answers to Any of the Above is "No," Do You Think a Guard Should Be Installed?
If no, why? _____

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enlist his active support. When improvement becomes his idea, his reasons for resistance are overcome. The guard inventory must be used in such a manner that all reasonable guards requested are furnished as quickly as possible, or a lack of confidence in the sincerity of management may result. For this reason, it may be worthwhile to carry on the program by individual departments, the order of inclusion being based on frequency and severity rates of the past.

After the necessity for guards has been determined and guards provided for the machines, the next, and possibly most difficult, problem is to assure usage of the guards. This must be accomplished by training the operators to follow safe practices and proper methods in guard maintenance and usage.

The key to any safety practice or procedure within the shop is the foreman. He is the only unit of management who is constantly in the work area and can maintain proper methods and procedures. Because the foreman is assigned the details of many functions, we should try to relieve him of as much detailed attention as possible.

This may be done by furnishing guards which must be used in order to operate the machine. Other means which relieve the foreman of the detailed duty of checking guards, are machines which are fed at one point with the work taking place at successive locations apart from the loading stations and personnel, such as the double-end tenoner.

Caution with Color

However, mechanical guards, which may be removed and expose the operator or other personnel, require attention from the foreman to see that they are used. In this case, we should strive to make it as easy for the foreman as

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possible. Possibly the most effective means is by using a color scheme for the various units or areas of the machine and guard. This means that when the guards are not positioned properly, the color regularity is disrupted and is, subconsciously, called to the attention of the foreman, operating personnel, or others.

One color scheme for this purpose is:

1. "Machine grey" for exterior areas of the machine.
2. "Safety green" or "machine grey" for the visible portion of the guard when it is in proper position.
3. "Alert orange" for areas of the machine visible when the guard is out of position.
4. "Alert orange" for inside of guard or portions not visible when in proper position.

In addition to day-to-day maintenance of guard usage, regular safety inspection personnel should include machine guards on all inspection itineraries. This keeps the inspection group conscious of any deviations from proper use of the guards provided, and also increases the probability of the determination of new or improved guard requirements.

However, the machine operator is the best informed man in the plant as concerns his machine. Therefore, he should be included in this maintenance program by use of regular guard inventory programs. These should be made every six months to a year and offer the operator an opportunity to express his opinions and desires as concerns guarding his own machine. This guard inventory may be included in the over-all safety inventory if one is used in the plant. Otherwise the guard inventory offers a logical initial application of the principles involved and can later be expanded to include all safety problems and considerations.

Machine guarding should be considered as the foundation upon which all other safety procedures and practices are based. No management can expect its shop personnel to work safely, acquire safe habits, or show an interest in the safety of their fellow workers unless they are provided a safe place to work. Machine safeguarding creates, at least partially, a safe environment and is an incentive for workmen to develop safe working habits and safety consciousness.

Pictures courtesy of the Wood Products Laboratory and visiting lecturer Rudolph Willard, North Carolina State College, Raleigh, North Carolina.

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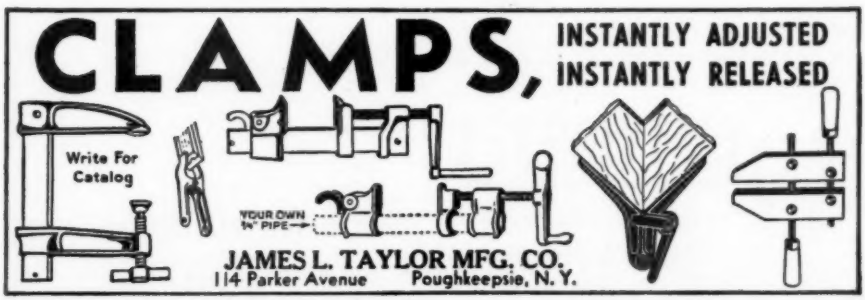

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___Blankets, paper
___Bleachers
___Blower & Fan Systems
___Belt Drivers
___Bolts
___Booths, spray
___Borers (Specify Kind)
___Boring Tools
___Brazing Equipment
___Brushes
___Casters
___Clamp Carriers
___Clamping Fixtures
___Clamps (Specify Type)
___Clamps & Jigs
___Cleaners, booth
___Clippers, veneer
___Compressors, air
___Conveyors
___Cutoff tools
___Cutter Blanks
___Cutter Heads
___Cutters (Specify Kind)
___Cylinders, air
___Cylinders, hydraulic
___Dado Heads
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___Dowels
___Drawer Equipment
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___Drill Heads
___Drills, electric
___Drills, multiple spindle
___Dry Kilns
___Dry Kiln Control Devices
___Dust Control Equip.
___Edge Banding Equip.
___Edgers, lumber
___Enamel
___End Matchers
___Fasteners
___Fastener Driving Equip.
___Filling Room Equip.
___Finishes
___Flexible Shaft Equip.
___Furniture & Chair Parts
___Gauges, saw
___Generators
___Glues, electronic
___Glues, veneer tapeless edge
___Grinders
___Grooves
___Guards, machine
___Guide Lights
___Guides, saw
___Guns, glue
___Guns, spray
___Hardboard
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___Heaters, glue
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___Jointers, veneer
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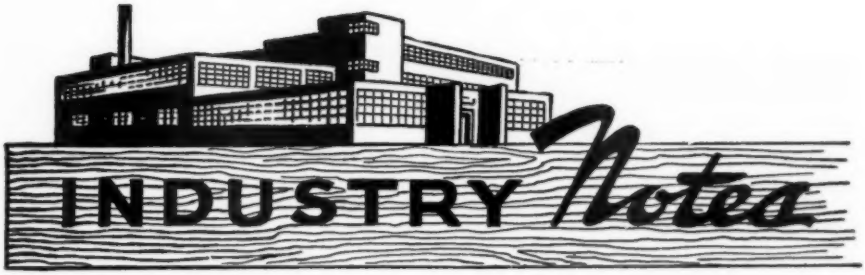

FIR PLYWOOD JUBILEE

Western fir plywood manufacturers are celebrating their 50th anniversary this year with a Golden Jubilee promotion aimed at increasing sales by 10 million feet a week throughout the year.

That's the word from Douglas Fir Plywood Association of Tacoma, Wash., the industry trade association which represents Washington, Oregon and California's 97 fir plywood mills which produce three-fourths of the nation's panels.

According to W. E. Difford, association managing director, "We will celebrate the occasion with the biggest sales promotion effort ever undertaken for this all-purpose building product."

The heart of the promotion will be 50 Golden Ideas for building or remodeling with fir plywood designed by five of the nation's topflight architects. The industry will preview them with all the drama of a new "opening" in mid-June. The presentation will take place in Portland, Ore., where the first fir plywood was produced for exhibit at that city's world fair in 1905. It will be the biggest meeting of plywood business people ever assembled at one time.

WHITNEY OFFICIALS ACQUIRE CONTROL

In January, 1955, three key officers and employees of Baxter D. Whitney & Son, Inc., Winchendon, Massachusetts, acquired control of the entire Whitney line of woodworking machinery. These men are W. M. Morlock, president; K. O. Brown, vice-president in charge of sales and Guy R. Prebble, Jr., production controller, whose combined service with Baxter D. Whitney & Son, Inc. totals 118 years. These gentlemen will continue in the same capacities in the corporation and Mr. Prebble will take on the additional duties of secretary.

Operations will continue as Baxter D. Whitney & Son, Inc. and the headquarters and principal sales offices will remain in Winchendon, where President Morlock and Vice-President Brown will be located.

President Morlock announces that arrangements have been made for the entire line of Whitney machines to be manufactured in the plant of the Newman Machine Company, Inc. in Greensboro, North Carolina, where experienced Whitney personnel are to be sent.

SAFETY CONFERENCE

The Central New York Safety Conference and Exposition is to be held at Syracuse, N.Y., May 16-18. Thirty sessions with over 100 speakers and panel participants are planned. Chairman for the conference will be Harold B. Gatslick, instructor in the Department of Forest Utilization, State University of New York College of Forestry.

Here are a few of the topics included in the program: compensation rates, employee education, prime accident causes, good housekeeping in the woodworking plant, and psychology and safety. Theme for the conference is "Safety pays . . . let's make it!"

NEW QUARTERS FOR REES

After 48 years in San Francisco the Rees Blow Pipe Mfg. Co. has moved to its new permanent location of 2929 Fifth Street, Berkeley 10, California.

The new building is of the tilt up type concrete construction and contains 43,000 square feet of floor space, including the offices as well as the manufacturing plant. The machinery and equipment have been re-aligned to form an up-to-date production line.

The company's principal products are blow pipe systems; dust arrestor and fume control systems; woodworking plant waste material burners; dry kilns; industrial fans; chargers and pneumatic conveying systems.

The most widely distributed product is the waste material burner which has been adapted to the requirements of sawmills, planing mills and furniture manufacturing plants. There are two basic type of burners. One is the double wall burner which can be fabricated in 13 different sizes and the other is the single wall burner which can be fabricated in 20 different sizes.

In addition to its affiliates at Los Angeles and Redding, California, the Rees Blow Pipe Mfg. Co. has affiliated companies in the following locations: Rees Burners Ltd., Vancouver, B.C., Canada; Rees Burner & Blow Pipe Co., Memphis, Tennessee; Medford Blow Pipe Co., Medford, Oregon; and Humboldt Sheet Metal Works, Eureka, Calif.

The officers of the company are Mr. Claude Rees, president; C. Russell Rees, vice-president; Lloyd D. Rees, secretary and production superintendent and these men are ably assisted by a group of engineers headed by Charles W. Kraut and Robert A. Fisher.

MARCOLOY-GARRISON MEETING ON CARBIDE TOOLS

Marcoloy, Inc., a large manufacturer of woodworking carbide tools for the woodworking industry, in association with their southeastern representative the Garrison Machinery Company of Statesville, North Carolina, held two meetings during the month of February in North Carolina. On February 22, 1955 a meeting was held in Lenoir at the Carlheim Hotel with the following companies having representatives in attendance: Caldwell Furniture Company. Lenoir; Drexel Furniture Company, Morganton; Harper Furniture Company, Lenoir; Hickory Chair Company, Hickory; Lenoir Chair Company, Newton; Lenoir Furniture Corporation, Lenoir; North Carolina Furniture Company, Statesville; Southern Desk Company, Hickory; Sherrill Furniture Company, Statesville; Statesville Manufacturing Company, Statesville; Unagusta Manufacturing Company, Hazelwood.

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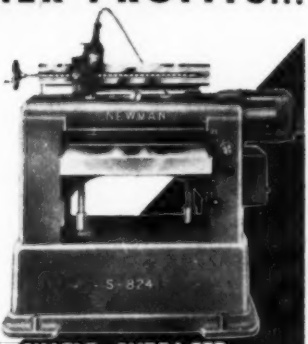
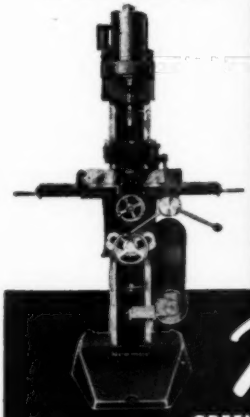


S–824 SINGLE SURFACER

K-16 VARIETY SAW

G-232 HYDRAULIC KNIFE GRINDER

T-20 MORTISER



The machines shown here are but a few of those manufactured in our big new modern plant which turns out a full line of up-to-the-minute woodworking machinery. Our staff of design engineers constantly seek newer, finer techniques and quality controls. All moving parts — shafts, pulleys, heads are dynetrically balanced for smooth vibration-free service and long productive life. Full details of any Newman Machine is yours on request.

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Heavier Construction for greater accuracy.
MILLBURY MACHINE COMPANY
13 WATERS STREET, MILLBURY, MASS.

On February 24, 1955 a similar meeting was held at the Sheraton Hotel in High Point with representatives from these companies attending: Thomasville Chair Company, Thomasville; Sylvania Electric Products, High Point; Craftique, Inc., Mebane; Sanford Furniture Company, Sanford; Alma Desk Company, High Point; Continental Furniture Company, High Point; Tomlinson of High Point, High Point.

This Marcoloy-Garrison sponsored meeting was an educational program outlined to better acquaint those attending with the manufacturing procedures used in the making of carbide cutterheads and tools. The design of the Marcoloy dovetail type cutterhead was described in detail showing why this particular cutterhead has great flexibility.

The program consisted of colored slides and comments by Marc A. Corti, president of Marcoloy, Inc., in which the procedures used in the making of carbide cutterheads and tools were illustrated. Following these slides was a question and answer period on which the various representatives were invited to ask questions relating to these procedures. Description of specific applications already in operation in this area were described by Robert C. Garrison, president of the Garrison Machinery Company. On display was a complete assortment of cutterheads including a shaper, tenoner, saw blades, cope, molder, various profile cutters, router bits and dovetail bits. The design and application for these tools was described by John Horton, sales manager of the woodworking division of Marcoloy, Inc.

MAAS & WALDSTEIN HONORS EMPLOYEE

A trancontinental initiation into Maas & Waldstein Co. 25 Year Club was held when men from the company's Newark, N.J., Chicago and Los Angeles plants were simultaneously welcomed into the quarter-century group in a recent ceremony at the Essex House Hotel, Newark, N.J. It marked the first

Dr. G. Klinkenstein, left, president of Maas & Waldstein Co., welcomes Charles L. Berry into the company's 25 Year Club. At right is Mr. Robert F. Magnus, treasurer.

time in this paint manufacturer's 79-year history that representatives from all three of its plants participated in a group initiation.

The new members included Mr. Charles L. Berry, Manager of the company's Mid-Western Industrial Division in Chicago, Mr. Joseph Stelker of the Newark plant and Mr. Leo Pucacco of the company's Smith Davis Division in Los Angeles. Each received a gold wrist watch and lapel pin commemorating his 25 years with Maas & Waldstein Co.

APPOINTMENTS

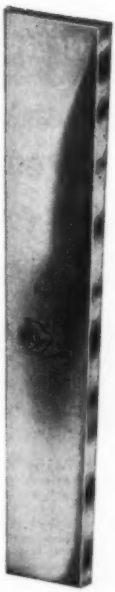
James E. Good has been appointed central industrial division manager and **John G. Deutsch** as western industrial division manager for the Atkins Saw Div., Borg-Warner Corp., Indianapolis.

Promotion of **Ralph E. Unterzuber** and **George H. Williams** to new positions in the industrial trades tape division has been announced by Minnesota Mining & Manufacturing Co. Unterzuber has been appointed central regional sales manager. Williams replaces Unterzuber as industrial trades tape sales manager of the Cleveland and Detroit operations.

OUR 70th ANNIVERSARY of KNIFE-MAKING ● EXCLUSIVELY ● FOR BEST QUALITY And HIGH PRODUCTION

DETROIT KNIVES

PLANER-MOULDER
VENEER-CLIPPER
SHAPER STEEL



Long, tedious research in materials and methods have resulted in the High Production and Low Cutting Cost, found in DETROIT KNIVES.

This year marks the 70th year devoted to making better knives.

Better knives since 1885

DETROIT EDGE TOOL CO.
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...THE ONLY CEMENT WITH THE LONGTIME SHELF LIFE GUARANTEE

NEW STIX Does Not Thicken With Age. STIX Needs No Clamps, Presses or Heat.

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UP PRODUCTION—
Cut Costs!
PLANER KNIVES
MOULDER KNIVES
SHAPER STEEL
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WITH
Supreme
KNIVES
You step up your production with Supreme Knives... milled to exact specifications... to insure a perfect fit in the machine. Made from the correct alloy steel for your particular job, Supreme Knives work harder... longer. The expense of early re-sharpening and replacing is eliminated. We design and make Special Knives to your requirements.
WRITE TODAY FOR YOUR COPY OF THE SUPREME CATALOG NO. E
VENEER KNIVES
SHEAR KNIVES
CIRCULAR KNIVES
SEND US YOUR CARBIDE-TIPPED KNIVES CUTTERS ROUTER BITS
We will promptly repair, retip and sharpen your Carbide-Tipped tools and get them back to you without delay. Skilled workmen and precision equipment insure fast service and complete satisfaction in restoring cutting efficiency.
PROMPT DEPENDABLE SERVICE
THE SAW & KNIFE SPECIALTY CO., INC.
4574 CARNEGIE AVENUE • CLEVELAND 3, OHIO

James G. Boden has been re-elected vice-president of the National Wood Work Manufacturers Association.

DeWalt Inc. has named **Edward W. Forth** as general superintendent. In his new capacity he replaces Harold Sneed who recently retired.

Oliver W. Jokerst will be district sales manager, with headquarters in St. Louis, Mo., for the National Gypsum Company.

Supervisor of Forest Products for the Central Staff Traffic and Transportation Department of Koppers Co., Inc., is **Paul R. Dupree.**

Ralph J. Johnson joins the National Association of Home Builders this month as director of the Construction Department and Research Institute. He succeeds Leonard G. Haeger.

Recently elected president of the Commander Manufacturing Co., Chicago, is **Frank J. O'Laughlin.** J. B. Chamberlain, former head of Commander, will be less active in the management of the company, but continues his interest as chairman of the board.

WESTERN PINE OFFICERS

Lloyd Helmer, head of a small Montana lumber operation and long active in conservation and lumber circles, was named head of the Western Pine Association recently.

The association is a trade organization of some 350 mills from throughout the 12-state western pine region. The new slate of officers was named at the close of the three-day business sessions held each year in San Francisco.

Elected to vice presidential positions with the big lumber trade organization were George Barkhurst, Michigan River Timber Co., Laramie, Wyo., and A. B. Hood, Ralph L. Smith Lumber Co., Anderson, Calif. Renamed treasurer was C. T. Gray, Stockton Box Co., Stockton, Calif.

WALNUT ASSOCIATION ELECTS

R. Hollowell

Robert Hollowell, Jr., vice-president of Pierson-Hollowell Co., Inc., Indianapolis, Indiana, was elected president of the American Walnut Manufacturers Association at the association's annual meeting recently held in Chicago.

Other elected officers are: vice-president, J. J. Egan, president of Kentucky Veneer Works, Inc., Louisville, Kentucky; treasurer, J. B. Petrus, Jr., Midwest Walnut Company, Council Bluffs, Iowa; Charles H. White, secretary-manager of the association.

The out-going president is Louis Vonderbrink of P. V. Shoe Walnut Company, Cincinnati, Ohio, who served during 1954 with Robert Hollowell, Jr., vice-president and J. B. Petrus, Treas.

Now in its 43rd year, the American Walnut Manufacturers Association was formally organized to develop export and domestic markets. Soon afterwards, the Walnut Association developed an excellent war record, having furnished gunstocks and airplane propellors during World World War I. The association did a similar but larger scale job in World War II.

The chief function of the association is to assist walnut lumber and veneer using industries in the procurement, finishing and merchandising of walnut products. Through consumer and trade advertising and educational brochures it promotes steady and new markets for walnut.

"What is the difference between capital and labor?" Willie asked his father.

"Well, son," his father answered. "The money you lend represents capital; getting it back represents labor."

FIELD

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CUTTING EQUIPMENT

A TOOL ROOM Product

By A Tool Room Expert!

Use our double bearing guide bars for flat bottom mortises. The riveted plate and bearing construction provides the utmost in strength and interchangeability. More than 90 standard and many special sizes of cutting equipment in stock. We are well-equipped to furnish special sizes like the above bar in many widths and lengths.

Write for complete information on our chain mortising equipment.

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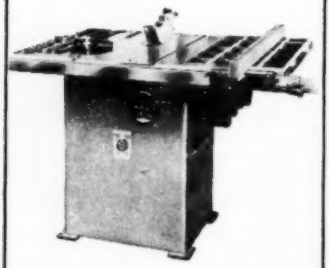
walker-turner

LIGHT-HEAVYWEIGHT MACHINE TOOLS

designed especially for light-heavyweight

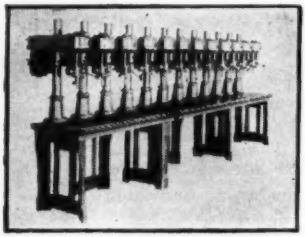
WOODWORKING



Newly Designed LIGHT-HEAVYWEIGHT **10" TILTING ARBOR SAW** Sturdily Built for Lasting Accuracy

16" LIGHT-HEAVY-WEIGHT VARIABLE SPEED BAND SAW the Ideal Machine for Metal-working and Woodworking

The complete line of W-T LIGHT-HEAVYWEIGHTS includes



LIGHT-HEAVYWEIGHT COMBINATION 20" MULTI-SPINDLE DRILL PRESS 6 Table Sections — 12 Drilling Units

DRILL PRESSES — Hand and Power Feed • AIR FEED DRILL PRESS ATTACHMENT • RADIAL DRILLS • Wood and Metal Cutting BAND SAWS • TILTING ARBOR SAWS • RADIAL SAWS • JIG SAWS • LATHES • SPINDLE SHAPERS • JOINTERS BELT AND DISC SURFACERS • FLEXIBLE SHAFT MACHINES

Call your nearby W-T distributor listed under "TOOLS" in your Telephone Directory

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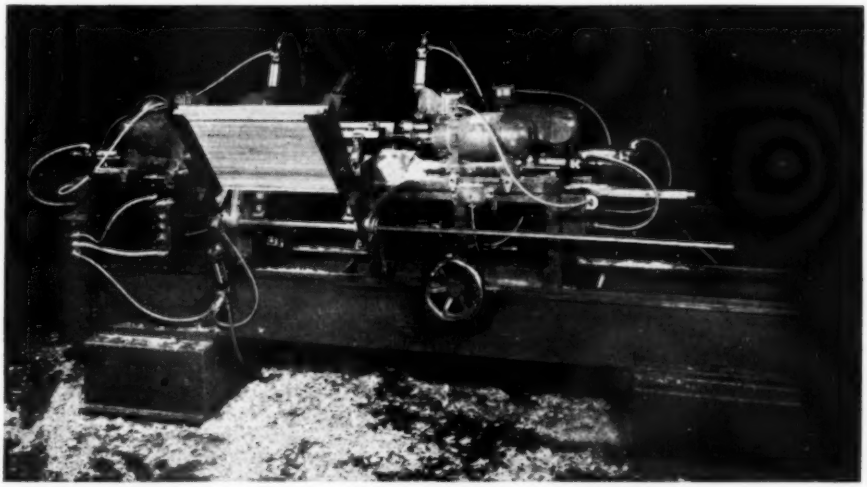
KEARNEY AND TRECKER CORPORATION

PLAINFIELD, N. J.

EQUIPMENT and Supplies for the WOODWORKING INDUSTRY

HAWKER MULTI-PURPOSE DOUBLE END CHUCKING AND BORING MACHINE



A new high speed woodworking machine tool for production of parts for furniture, toys, or other articles using square, round, or rectangular stock has been developed by The Hawker Manufacturing Company, 1449 Keowee St., Dayton, Ohio.

Work-heads of the new rotary chucking machine may be tooled for right or compound angular tenoning and to cut to length, mill, taper, drill, slot, or thread internally or externally. Up to six different operations can be done simultaneously by the hydraulically actuated machine. The machine can be built to meet special needs of the user.

Production of 2,000 to 3,000 pieces an hour is possible, the speed depending on the nature of the finished part required. The operator merely keeps the automatic feeding rack loaded with stock. The work-piece is positively centered regardless of original shape.

The machine is designed for rapid

production of such items as folding chair legs, backs, braces, rungs, and the like, as well as many other furniture and toy parts, and mop handles and similar pieces.

The machine can be set to handle stock from 6" to 6' long, from ⅜" to 2" diameter, and from ½" to 1¼" square. A 4" chucking stroke is standard.

HAND FEED 8" DUAL PURPOSE GLUE SPREADER

Black Brothers popular 8" glue spreader is called upon to perform an increasing number of diversified gluing operations. One of the most recent adaptations is pictured here.

This special arrangement is to be used in the manufacture of television cabinets. The panels, comprising the top, bottom and ends of the cabinet, are dove-tailed by what may be described as a modified T&G operation. It is therefore, important that the glue line application be confined to only ¾" of the "tongue", and because of possible electronic interference no glue can be permitted on the shallow rabbet panel edge groovings.

This problem is solved with a special offset grooving spaced equidistance at either end of the resilient rubber glue roll. Adjustable fences or guides are fitted on top of the spreader frame to insure exact alignment as the panel edges are hand fed over the roll. This arrangement embraces 1¾" at each end of the standard 8" long roll leaving 4½" in the center which may be grooved as production needs require. After the panel edges have been glued the case assembly is moved into an electronically operated clamp for curing.

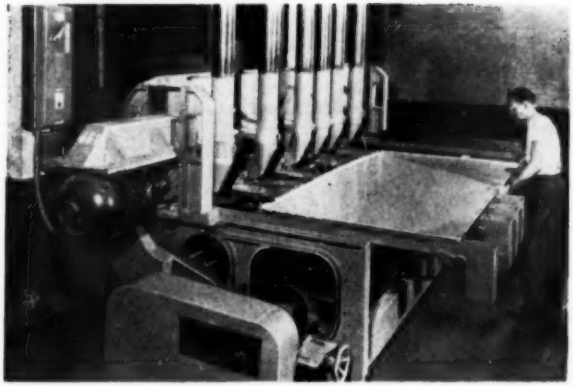
The glue roll of this spreader is balanced very accurately. An adjustable doctor scraper controls the depth of the glue line, and the roll may be removed from the tank for easy cleaning. The motor drive is used as it applies even and economical glue line and prevents chilling of the glue on the exposed portions of the roll.

COAXIAL TRIODES

Machlett Laboratories, Springdale, Conn., announces the ML-6422 and ML-6423 coaxial-terminal triodes, employing thoriated-tungsten filaments, for industrial and broadcast equipments of 10-15 kw power output. As replacements for type 892 and 892R as well as types 5668 and 5669, the new triodes provide improved performance ratings, safety margins and strength. New thoriated-tungsten filaments greatly reduce power requirements while offering life increases to 100%. Plate current ratings are increased by 25%, grid current ratings by 20%; terminal inductances are very low; high transconductance characteristics, up 70%, assure stable operation, low grid drive and high plate efficiency.

ML-6422 uses standard Machlett water jacket and is rated from 40 kw input, 20 kw anode dissipation. ML-6423 employs unique aluminum radiator to reduce weight to 16 pounds as compared with 52 pounds for conventional type; ML-6423 is rated for 30 kw input, 12.5 kw anode dissipation. Full ratings on both tubes to 30mc; reduced ratings to 90mc.

MACHINE SAWS SHEET PLASTIC



An industrial woodworking machine is being used to cut desk tops from laminated plastic sheet stock. American Seating Co., Grand Rapids, Mich., is cutting four to six school desk tops from a 4" x 8" sheet in approximately 40 seconds.

The machine used for this task is a Mereen-Johnson No. 435 H multiple cutoff with variable speed chain feed.

The desk top material used by American Seating is multiple-ply melamine and phenolic resin impregnated kraft paper with a hardwood core. Thickness of the material is determined by the application. A long wearing desk top with a smooth, hard finish is obtained with this plastic material.

American Seating runs the 4" x 8" sheets through the multiple cutoff saw twice. On the first run through, the machine's saws cut the big sheet into several strips. On the second trip through the machine, the strips are cut laterally into rectangles which are the desk top blanks.

Two men feed the M-J 435-H by placing one or several stacked sheets on the chain feed. After the material has passed through the saws on its first cutting, it falls onto a roller conveyor which carries the partially ready blanks back to the operator for the final cut.

The production rate can be varied by the rate of the chain feed and by the number of sheets fed into the machine at one time. Manufacturer of the No. 435-H cutoff saw is Mereen-Johnson Machine Co., 4401 Lyndale Ave. No., Minneapolis 12, Minn.

CARBIDE ROUTER BITS

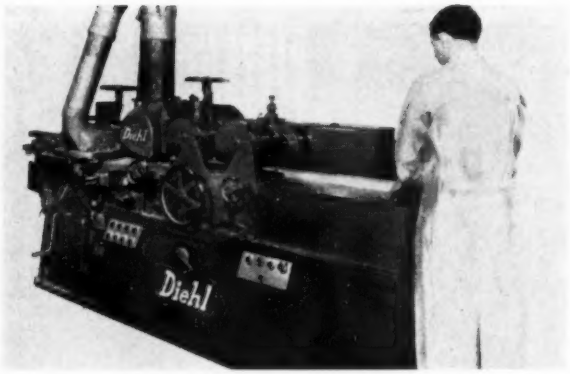
A line of newly designed carbide router bits with diamond-ground carbide cutting edges has been announced by Marcoloy, Inc., Springdale, Conn.

All cutting edges are precision ground with diamond wheels. Steel shank and body is a special alloy heat-treated steel. All bits are notched for end and plunge cutting. Carbide cutting edges are Marcoloy's WG Grade, formulated especially for woodworking and cutting non-ferrous metals.

These new Marcoloy carbide router bits are available in sizes from ¼" diameter up to 1½", and with either ¼" or ½" shanks.

They say the first man to go on a 40-hour week was Robinson Crusoe. He had all his work done by Friday.

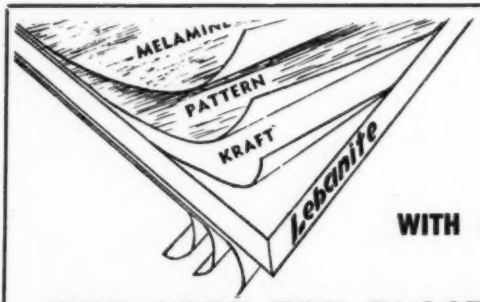
DIEHL MOLDER



A new heavy-duty Diehl 6" and 8" 4-head molder has been announced by the G. M. Diehl Machine Works, Inc., Wabash, Ind.

The molder features variable speed drive, a new feed works assembly, new motor controls, new feed roll assembly, a specially-designed base, and new modifications of the exclusive Diehl integrated spindle.

The variable speed drive is offered as standard equipment on both 6" and 8" molders, with a ratio of 7.9:1, and providing standard feed speeds from 20 to 151 fpm. Optional variable speeds are available up to 387 fpm. The vari-



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THE CORE FOR PLASTIC DECORATIVES

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1/8"
3/16"
1/4"
or multiples

standard panels up to 50"x100"

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REDUCES ASSEMBLY COST
MINIMUM WARPAGE IN FINAL PRODUCT
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REDUCES CRAZING PROBLEM
BEST ABRASION QUALITIES

ABSORPTION LESS THAN 3% (24 hrs. full immersion)

WESLEY K. SWIFT ASSOCIATES, MOLINE, ILL.
or: 314 MURRAY BUILDING - MODERN WOODS
GRAND RAPIDS, MICH. - ALMA, NORTH CAROLINA

Canadian Office: L. T. MURPHY, 2049 DUNDAS ST., WEST, TORONTO

able speed controls are mounted on the front of the machine, directly below the handwheel of the feed roll hoist. The unit is mounted directly on the molder base, and is powered by a 7½ hp. drive motor. Optional 10 hp. drive is available on request.

The new feed works assembly features an input worm shaft under a worm gear output shaft, permitting an extremely short feed belt to reduce possibility of feed works vibration or flutter. The heavy-duty worm is integral with the hardened and ground shaft, to prevent distortion or deflection. The entire unit runs in oil, with high oil capacity and large gear housing area for maximum cooling efficiency.

The new feed roll assembly provides quick roll changes, through removable end caps on the feed roll yokes—permitting maximum accessibility. An air-controlled feed roll pressure system is available as an optional feature, assuring even, positive pressure on variable stock thicknesses for steadier feed.

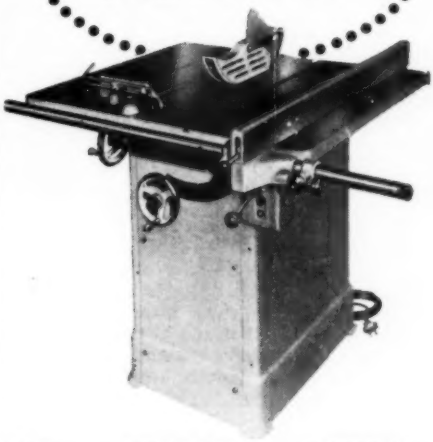
New design modification of the Diehl integrated spindle include super- precision bearings located 2" closer to the motor, and ½" closer to the cutterhead, for bearing support much closer to the load area. Spring pre-loading is incorporated, with 200 pounds of pressure applied directly against the bearing face to eliminate possibility of both end play and radial play. The spindle itself has ¼" more outside diameter at the point of bearing mounting. The integrated spindle features independent mounting within its own housing, with all power transmitted from the rotor to the cutterhead through the enlarged middle section and over both bearings, for truer, smoother operation at higher speeds.

PAINT MASK

The new "Flex-A-Prene" paint mask, recently developed by Flexo Products, Inc., Cleveland 13, Ohio, provides positive low cost protection for spray paint operators. It keeps out paint pigments

new heavy duty

10" TILTING ARBOR SAW



SAFE . . . ACCURATE . . . POWERFUL

Big, rugged, safe, powerful, precision machined for utmost accuracy. Check these features: Operates from 1 or 1½ H.P. motor . . . has 3 belt drive utilizing full motor power . . . extra heavy trunions for rigidity . . . large ground and polished table top . . . improved front and rear locking rip fence . . . tubular guide bars increase table capacity to 44½ " . . . graduated scale on front bar . . . blade tilting and raising wheels lock securely . . . specially designed mitre slot "holds" gauge and prevents accidental dropping . . . snap-out base panel for sawdust removal, plus others.

SPECIFICATIONS: *Table top 33"x38" with ext.; depth of cut 3¼"; at 45°—2-7/16"; ⅝" spindle mounted on sealed ball bearings; standard equipment includes: deluxe mitre gauge, throat insert, rip fence, comb. blade, guard, splitter, anti-kick back, switch bracket, motor pulley and V-belts only* $295.

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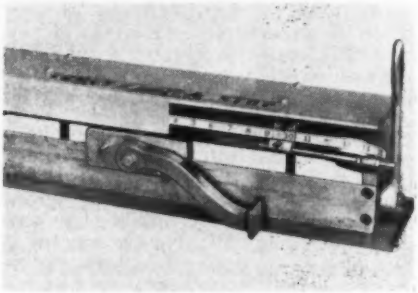
World's largest manufacturers of Power & Hand Tools (Duro Chrome)

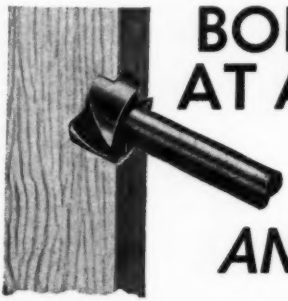
and solvents efficiently and is comfortable to wear. The "Flex-A-Prene" paint mask weighs only one ounce and can be worn with goggles or spectacles.

An entirely new filter material, "Prenex," is utilized. "Prenex" is not affected by paint pigments or solvents and won't clog, soften, swell or jell . . . even after hundreds of hours of exposure. This filter lasts much longer than conventional paint mask filters and cuts down on costly lost production hours because less frequent filter replacements are required.

QUICK STOP GAUGE

A new very versatile, fast stop gauge called the Comet "Quick" stop gauge has been announced by Consolidated Machinery & Supply Co., Ltd., 2033 Santa





BORES AT ANY ANGLE

Forstner Bit

Because it is guided by its circular rim the Forstner Bit bores at any angle . . . even against the grain and into knots, leaving a true polished surface. In machine shanks from ¼" to 3". Order from your distributor today.

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Carter
BAND-SAW MACHINE ACCESSORIES

used as standard equipment by leading band-saw manufacturers . . .

- CARTER RIGID BAND-SAW WHEELS
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cut costs way down, improve quality!

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GRAND RAPIDS 2, MICHIGAN

Fe Ave., Los Angeles 21, Calif. This device is especially useful in cabinet shops, furniture factories, etc., wherever pieces of various lengths are to be cut or measured.

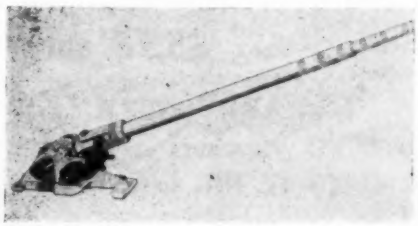
The "Quick" stop gauge can be adjusted quickly and with hairline accuracy, without the operator moving from his position at the saw. The exact distance from the gauging arm or stop to the cutting line of the saw is indicated at all times on a belt like measuring tape, with clearly marked numerals, under a hairline. A quick fingertip adjustment and stop is set at desired length, then lock the lever. It is easily installed on any radial type saw, swing saw, boring machine, etc.

Designed to be mounted at the back of the bench, the "Quick" stop gauge becomes a straight edge as well as a stop gauge. The top of the bench or front of table where the material is placed is always clear. The gauging arm or stop is easily swung out of position when not in use as for ripping

STEEL STRAPPING STRETCHER

The Gerrard Steel Strapping Division, United States Steel Corporation, 2915 W. 47th St., Chicago, announces a newly developed flat steel strapping stretcher, their model 48, which accommodates 2" x .050 flat steel strapping.

Here are some of the advantages found in the new model: ease of carrying; free wheeling feature of tension drum for easier threading; a frame gripper locking in open position for easier threading; tension handle repositioning feature; easy removal of stretcher from trap after completion



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HARGRAVE

Modern Steel Spindle Hand Screws

Threaded spindles are cold drawn. Acme threads for long wear and smooth easy operation. Selected hard maple jaws properly seasoned and oiled.

The complete clamp is "Load Tested" to assure freedom from structural failure in use.

ASK YOUR DISTRIBUTOR for a copy of the new Hargrave Catalog with selection-application information.

THE CINCINNATI TOOL CO.
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Cincinnati 12, Ohio

HARGRAVE
The Complete Line of Tested
TOOLS

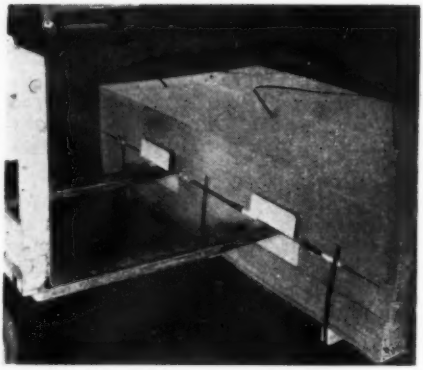
of tie; extension handle for added leverage in tensioning when necessary; and ease of maintenance due to long life parts and four faced gripper.

HANDLING PROBLEMS SOLVED

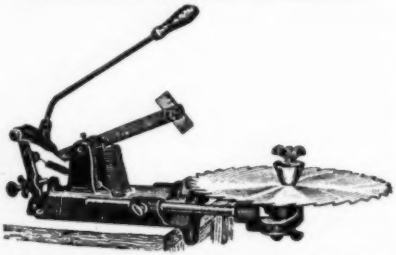
Little things leading to important things like customer satisfaction are important to any company. In the case of the warehouse department at Masonite Corporation's plant in Laurel, Mississippi, the little things were four small steel plates and a few feet of steel strapping. Their use increased the handling efficiency at the plant and, more important, solved a materials-handling headache for many customers.

Because Masonite's big fork trucks could handle 3,000-lb. steel-strapped bundles of hardboard economically, units of this size were shipped to customers who could handle them. However, few customers had fork trucks that could handle such heavy loads, so a new idea was tried.

The original bundle size was maintained for economy, but the unit was divided into two or three sections by 1" x 4" x 4' separators before bundling with Signode steel strapping. The 1" opening between units would not accommodate the forks of the lift trucks. so Masonite developed an "easy entry plate" which would permit entry of the forks without damaging the edges or surface of the hardboards.



SIMPLEX
CIRCULAR SAW SETTING MACHINE



An excellent tool for setting small circular saws. The successful operation of all circular saws depends largely upon the manner in which they are fitted.

To obtain the best results the teeth should be properly and evenly set.

This machine does the work perfectly, insuring easy and true running and smooth cutting.

The hammer strikes every blow with equal force and at the same angle hence the set of each tooth is absolutely uniform. Will give a light, medium or heavy set.

Adjustable for saws, either rip or cut-off, from 5" to 24" in diameter.

The machine will last for years if handled with ordinary care and intelligence.

Further details upon request

ZEILLER & NAGEL, INC.
232 JAVA ST. BROOKLYN, 22, N.Y.

INTRODUCTORY OFFER AT
NEW LOW PRICES

NEW! MARCOLOY
CARBIDE ROUTER BITS

1. Cutting edges diamond-ground
2. Free and cool cutting
3. Designed for long life
4. Notched for end and plunge cutting

½" Size ...$5.75 each

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MARCOLOY CARBIDES

Dealer Inquiries Invited

MARCOLOY, INC. Springdale, Conn.

Now all the customer has to do is cut the steel strapping that holds the bundle, insert the easy entry plates, top and bottom, and ease the lift truck's forks under one unit of the load at a time! He is able to unload faster with greater safety to workers, and to spot his loads where he wants them quickly.

The easy entry plates can be made in your own shop, or by a local sheet metal shop at low cost. The tensional steel strapping seals, strapping tools and equipment used by Masonite at Laurel, Mississippi, were obtained from Signode Steel Strapping Company. If you want a detailed print of the entire operation, including a plan for making the easy entry plates, write Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Illinois.

NOISE PROTECTORS

American Optical Co. "Straightaway" sound protectors are a new type of device for preventing the harmful effects of loud noise encountered in many occupations. They screen out loud, high-frequency noises, but voices are audible to the wearer.

Constant exposure to noise of over 90 decibels may cause deafness, which is often compensible. Loud noise causes irritation and a lowered standard of morale; it causes a decrease in plant efficiency directly by hindering communication; it causes accidents, since warnings cannot be heard when drowned out by louder noises.

Straightaways are more effective, sanitary and more comfortable than earplug type protectors. Soft vinyl foam pads are held on externally, fit snugly and conform to ear contours. There are both helmet and headband models. Some are equipped with earphones which connect to communications systems.

For further information, write American Optical Company, Safety Products Division, Southbridge, Mass.

C.I.T. Terms Available
Write for bulletin and details

JACKSONVILLE BLOW PIPE CO.
Jacksonville, Florida
P. O. Box 3687

The Marvelous Montgomery

BLO-HOG (The only all-purpose hog in the world) Patents Pending

EATS UP EVERYTHING

. . . including Pine, Oak, Gum, Hickory, Elm, Cedar, Wet Veneer and Sandy Bark. Conveyor-fed — no attendant required. Positively protected from major damage by tramp steel. All connections locked — nothing to shake loose. Maintenance costs unbelievably low.

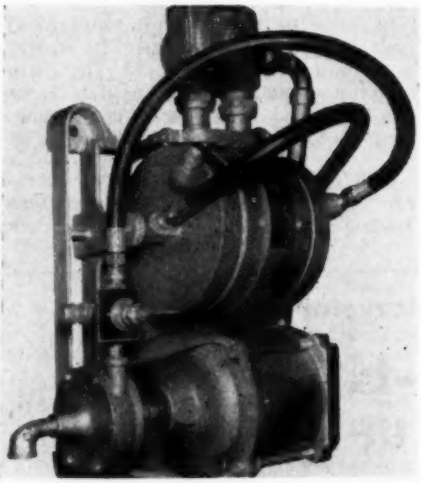
". . . Dear Mr. Montgomery: It is an unbelievable machine and it is still hard to believe that it is actually handling the enormous volume of scrap we are feeding into it. We operate the hog without an attendant—which means a considerable saving." — J. B. BLACK, Ocala Mfg. Co., Ocala, Fla.

Sumner Iron Works, Everett, Washington, W. Coast Rep.
Canadian Sumner Iron Works, Ltd., Vancouver, B.C., Canadian Rep.

ELECTRIC HOT SPRAY HEATER

Standard industrial finishes will now give more mileage, and better coverage when they are used with the new all-electric Circaflo 600 hot spray heater it is announced by the Spee-Flo Company, 720 Polk Ave., Houston, Texas.

The Circaflo 600 circulates and heats the paint, maintaining a uniform temperature at the spray gun, and at constant fluid pressure. Air pressure variations do not affect fluid pressure in this all-electric unit. Installation is as simple as connecting a hoseline, and full heat is reached in four minutes.



Circaflo 600 reduces "overspray" and provides marked material savings as a result of lower atomizing pressure, reduced by heat. The controlled delivery temperature in the hot spray range produces rapid solvent evaporation at the gun head, and permits deposit of a high-solids film on the work.

POCKET GUIDE FOR SAWMILLS

Almost every problem confronting the small sawmill operator—from where and how to set up a sawmill to how to saw logs with stringy bark—is covered in "Small Sawmills, A Pocket Guide" published by the U. S. Department of Agriculture.

Because small sawmills play an important part in the harvesting of timber throughout the country, the Forest Service's Forest Products Laboratory at Madison, Wis., prepared this 28-page pocket-size reference for operators, foremen and workers of small mills.

The guide suggests not only how to set up the mill and fit the saw, but how to check the mill for mechanical fitness, how to sharpen saw teeth, and how to determine proper saw and feed speeds. It discusses what causes the faulty sizing of lumber and how to correct it. It concludes with solutions to special sawing problems that most operators have to meet sometime, such as: how to handle outsize logs; small, knotty logs; low-grade logs; and frozen timber or very hard woods.

The guide, prepared by C. J. Telford, a small sawmill specialist at the Forest Products Laboratory, is Agriculture Handbook No. 70. A copy may be obtained from the Superintendent of Documents at the Government Printing Office, Washington 25, D.C. for 15c.

REVERSING CONTROLLER

A new die cast safety handle is now optional equipment on the Furnas Electric R44 drum controller. Cast to conform to the top of the case, the handle has no protruding edges for accidental operation. Designed to fit the palm of the operator's hand, only slight finger tip pressure is necessary to change the contacts from off to forward or reverse.

Furnas Electric reversing controllers are well known for their applications on woodworking machines, lathes, milling machines, and many other types of equipment. Sturdy in construction — these controllers have heavy-gauge steel frame and large, hard-rolled, copper contacts. Front removable wrap-around cover, completely exposes all contacts and provides easy accessibility to all terminals.

For complete information on drum controllers and other motor controls,

write for booklet No. 5411, Furnas Electric Company, 1059 McKee St., Batavia, Illinois.

PLYWOOD FISH LADDER

The world's first artificial spawning ground for silver salmon has also proved to be an unofficial testing ground for fir plywood.

That is the evidence from the University of Washington where a unique study of fish habits is being conducted. The experiment began in 1950 when salmon hatched at the school's fisheries department were released in artificial ponds there. These fish returned to spawn in 1951, the first time in history that such salmon had returned to man-made pools, scientists report.

The ponds at the University of Washington are linked to outside waters by a 42' fish ladder made of exterior type fir plywood. Although this plywood "river" has been subjected to constant immersion, the individual panels show

no signs of deterioration, another dramatic demonstration of the permanence of the glue-line in exterior fir plywood.

Where there's a will, there are relations.

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Woodward 3-0862

FURNITURE MAKERS HANDBOOK

A collective bargaining handbook written especially for furniture manufacturers will be published by the National Association of Furniture Manufacturers on April 4th.

This new copyrighted 90-page ready reference guide reveals the practices of the industry in all of the important phases of union-management negotiations.

Written by Lloyd R. Norris, director of the NAFM Industrial Relations Department, it is the result of nine years' intensive experience and an industry-wide study of a vast amount of confidential material.

The NAFM handbook contains the full text of six sample contracts which the practical experience of selected furniture manufacturers has proven to be typical of effective phraseology of contract clauses.

The handbook has a section entitled "Collective Bargaining Hints" which explains 10 basic practices that furniture manufacturers will find to be extremely valuable in handling their industrial relations problems. A chapter entitled "Twelve Basic Negotiating Principles" outlines time-tested methods that management can use in negotiating a satisfactory contract.

REFUSE BURNER BULLETIN

Redesigning of the Wilco refuse burner and addition of a new "Junior" model for small woodworking operations is announced by Wilco Machine Works, Inc., 1301 North Hollywood, Memphis, Tennessee. A new four-page, two-color bulletin featuring drawings of the "Junior" and "Senior" models is now available.

Among improvements in the burner are a new inner liner giving more protection, a new simplified dome and syphon draft construction for even easier erection, and a new forced draft system giving 100% more capacity and with infinitely variable control.

REDWOOD DATA SHEETS

Completing a series of informative data sheets on patterns used for interior and exterior walls of redwood, the California Redwood Association has issued sheets on "Anzac Siding Walls" and "Shiplap Walls." The new sheets describe these two patterns in detail including dimensions, applications, and other data. Each sheet has an attractive border showing a cross-section of the pattern it describes.

Shiplap redwood siding, which is desirable for interior paneling as well as exterior use, is especially adaptable to walls in contemporary design. Various architectural effects for which it is particularly useful, such as V-rustic, plain shiplap, cove rustic, and Boston rustic are briefly described.

Anzac pattern was introduced into the United States by the California redwood lumber mills from a New Zealand design. It is distinguished by a thick butt edge which gives it lateral emphasis. It is frequently used to decrease the apparent height of a wall or broaden the base of a building.

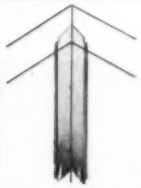
Single copies of these sheets and other information about properties, uses, and finishes of redwood may be obtained by writing to the California Redwood Association, 576 Sacramento Street, San Francisco 11, Calif.

JOB-TESTED CUTTING METHODS

A new idea booklet—16 pages in length —has been issued by DeWalt Inc., manufacturers of woodworking machinery. The free booklet entitled "New Ways to Make Money On Your Cutting Jobs with 'Job Tested' AMF DeWalt Methods" is now available from franchised DeWalt dealers or can be obtained by writing directly to the home office in Lancaster, Pa.

Departing from the usual "catalog" format, the booklet justifies capital goods expenditure by pointing out the various ways in which the firm's machinery can reduce costs and increase

The DUBLE VEE Miter Joint Fastener



• A special type of Wood Joint Fastener for a special purpose. The inverted "V" top of the DUBLE-VEE fastener neatly fills the miter flush, eliminating need of any fillers. This is a plus value in addition to the many time, labor and material savings for which all styles of our Wood Joint Fasteners are famous. It eliminates gluing—the time-consuming operation of applying and removing clamps—returns valuable floor space, formerly provided for drying of work, to production and greatly reduces production time per unit produced. Your net result is a sturdier, higher quality product you can market with an important price advantage. Send for complete information.

Fills as it Joins

CLAMP NAIL COMPANY
4542 West Palmer Street Chicago 39, Illinois

profit margins for the user. Some of the specific topics covered are: floor space savings, installation costs, obsolescence, operator fatigue and general efficiency, safety, material flow, waste and salvage, quality control, portability, versatility, and reduced "down-time."

TIMESAVERS SPEEDSANDER

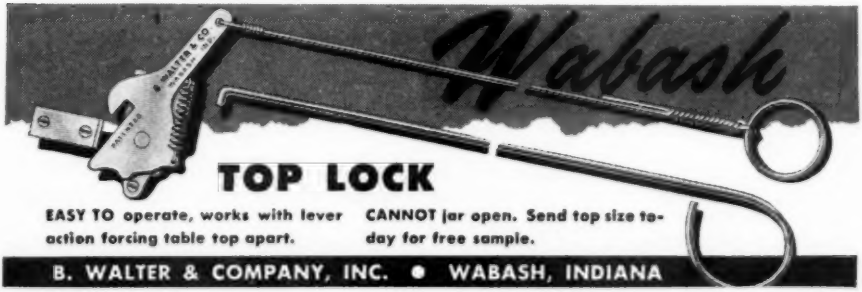
Timesavers Inc., has just issued a descriptive folder on their new Timesaver Speedmaster, an automatic feed abrasive belt sander for production sanding and polishing of straight wood stock. Model No's., specifications and general data pertaining to the machines operations are clearly set forth. Folder is available from Timesavers, Inc., P.O. Box L, Robbinsdale 22, Minnesota.

MATERIAL HANDLING REPORT

Hyster Company has issued a new field report on lumber handling, No. 57, in its current series of case histories on the practical application of modern materials handling equipment to the lumber industry. Prepared in the field by Hyster engineers, this illustrated report shows how a Hyster RC-150 lift-truck, together with a Hyster straddle truck, helps maintain an even flow of lumber storage, receiving and shipping in a typical lumber yard. Copies are available from the dealer nearest you, or by writing to the Hyster Company, P.O. Box 4318, Portland 8, Oregon.

MOTOR-ARBORS

Motor arbors are illustrated and described in a two color bulletin S-51 recently issued by and available from the manufacturer, the Imperial Electric Company, 64 Ira Avenue, Akron, Ohio. These arbors, it is stated, will be supplied with standard saw-flanges and nut or with special arbor extensions machined as may be required up to a maximum diameter of 2".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EASY TO operate, works with lever action forcing table top apart.
CANNOT jar open. Send top size today for free sample.
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H.D.M.A. ELECTION

Left to right: J. B. Edwards, J. Edgar Kennedy, W. G. Soderquist, H. C. Moser, George M. Rozzell, R. A. Goodrich, Philip G. Ring and C. T. Rhyne.

Members and guests of the Hardwood Dimension Manufacturers Association held their Annual Meeting at Grand Hotel, Point Clear, Alabama, recently.

The highlight of the meeting was a full half-day discussion on "costs." Serge A. Birn, Serge A. Birn Company, Louisville, Kentucky, who is recognized as one of the leading industrial engineers in the woodworking field, opened the discussion with a most interesting and informative talk on the value of "group incentives" in a dimension plant. He pointed out the importance of knowing one's cost in any industry.

Mr. Birn showed just how the profit picture might change for the better by a slight reduction in such items as direct labor, indirect labor, factory burden, etc., which go to make up cost of our product.

The business session was devoted to the annual report of J. Edgar Kennedy, managing director of the association, to committee reports and to a policy program for the operation of the association during the coming year.

The following Officers and Directors were elected:

Name	Company	Address
George M. Rozzell, President	E. A. Stewart Lumber Co.	Texarkana, Texas
W. G. Soderquist, Vice President	Williams-Brownell, Inc.	Asheville, N.C.
J. Edgar Kennedy, Sec.-Man. Dir.	HDMA	Nashville, Tenn.
H. C. Moser, Past President	Gamble Brothers, Inc.	Louisville, Ky.

Directors:

J. B. Edwards	Hillyer Deutsch Edwards	Oakdale, Louisiana
Charles T. Rhyne	Rhyne Lumber Company	Newport, Tennessee
Russell A. Goodrich	E. L. Bruce Company	Little Rock, Ark.
George H. Henderson	Angelina Hardwood Sales	Lufkin, Texas
Temple Webber	Temple Lumber Company	Diboll, Texas
A. C. Pruden	Pilliod Lumber Products	Flora, Mississippi

Trademarks and Patents

This is a reader service which we hope will continue to be helpful in avoiding infringement of trademarks and patents of others in the industry. The material has been compiled for us by James M. Heilman, director of the Legal and Patent Department, U. S. Plywood Corporation.

BELLOUNGER
For lounging chairs.
Bell Mfg. Company
San Francisco, Calif.

CRAFT WALL
For wall paneling.
Sequoia International, Inc.
Pasadena, Calif.

DUNBAR for MODERN
For furniture.
Dunbar Furniture Corp. of Ind.
Berne, Indiana

HEART-EASE
For lounging chairs.
Lewis & Conger
New York, N. Y.

INTERNATIONAL
For built-in permanent-type kitchens.
International Sash & Door Co.
Minneapolis, Minn.

JIFFY PICTURE FRAME
For picture frames.
Hutson Enterprises, Richmond, Calif.

KAMPERS KOMFORT and KOMFORT-FOLD
For chair commodes
Will-Mark Company
Van Nuys, Calif.

LITTLE MIRACLE
For wall cabinets.
Empire Hobby Industries Corp.
Brooklyn, N. Y.

MIROJOY
For chairs.
The Reflectone Corp.
Stamford, Conn.

NORYB
For saw grinding equipment.
Byron G. Daggett
San Diego, Calif.

PINE SHOP—on square with eagle and stars.
For furniture.
The Pine Shops, Inc.
Big Rapids, Michigan

PLATEEN
For table tops.
Douglas Furniture Corp.
Chicago, Illinois.

PRESDPLY
For construction board.
Masonite Corporation
Chicago, Illinois

RADIALLOY-TIPPED
For saws.
Radial Cutter Mfg. Co.
Elizabeth, N. J.

ROC LINER
For furniture.
National Furniture Co., Inc.
Evansville, Ind.

ROLLAFEED
For lathes.
United Eng. and Fdry. Co.
Pittsburgh, Pa.

SALES-O-MATIC

For display cases.
The Columbus Show Case Co.
Columbus, Ohio

SHADOLITE

For television tables.
Universal Company
High Point, N. C.

SUN-EZE

For garden furniture.
State Manufacturing Company
Los Angeles, Calif.

TOWN SQUARE

For furniture.
Northwest Chair Company
Tacoma, Wash.

UNISTORALL

For cabinets.
The Wright Line, Inc.
Worcester, Mass.

WALLTUF

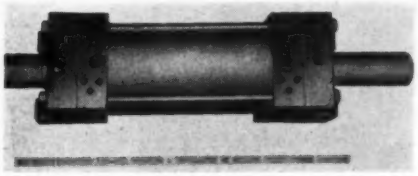
For hardboard.
United States Plywood Corp.
New York, N. Y.

AIR HYDRAULIC BOOSTER

A new, continuous-action, automatically reciprocating air-hydraulic booster capable of delivering an unlimited amount of high pressure fluid for the operation of hydraulic cylinders is announced by the Miller Fluid Power Co., Melrose Park, Ill.

The manufacturer believes it to be the first, heavy-duty unit of its type ever offered in a double-acting model. The new reciprocating booster operates from ordinary plant compressor air input and, while it does not build up its pressure nor discharge its oil as fast as the company's single acting B4 boosters, the new unit offers definite operational advantages and cost-savings in applications where large volumes of high pressure fluid are required. Essentially, the new booster consists of a double-rod end air cylinder with a hydraulic discharge pressure chamber at each end. Thus, it delivers a pressure output stroke in both directions.

At the end of each stroke, the piston assembly contacts an actuator button



on the inside of the cylinder. The movement of this button operates the actuator which, in turn, shifts the position of a four-way, two-position, double pilot operated valve causing reversal of air flow and corresponding reversal of booster stroke.

PLANETOR BITS

A solution to the problem of extremely limited tool use between sharpenings for machine bits used in plywood boring, is said to have been achieved by the recent introduction of a new "leed" point model in the Planetor bit line nationally distributed by Price & Rutzebeck, 22150 Mukland Ave., Haywood 50, Calif.

Cutting edges of the new "leed" point models approach plywood glue lines on

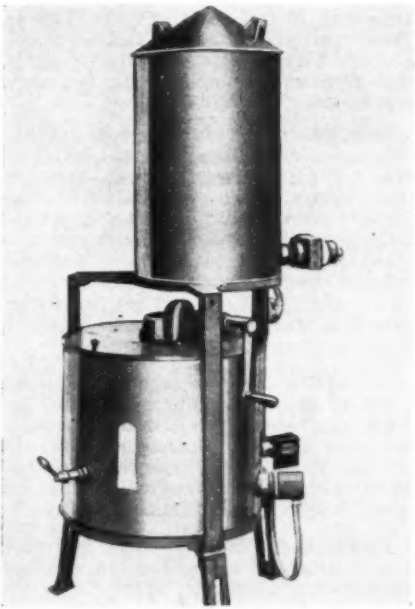
an angle and cut through them gradually, a feature which permits boring stacks as well as single sheets.

Increases up to 1,000 percent in bit life between sharpenings are claimed when the new models are used instead of flat-bottom types employing the "rub through" principle.

The full Planetor line has been increased to include "lead" points in all sizes 1" to 4½", by sixteenths. Larger sizes also are available on special order.

GLUE CONVERTER

The Zimmerman process filtering glue converter and the Ideal glue heater and mixer have recently been redesigned by the manufacturer, the Instantaneous Glue Converter Co., 2217 Iowa Ave., Cincinnati, Ohio.



The machine has automatic temperature control and is said to save up to 35% in glue. It is available in many sizes and can be heated by steam or electricity.

AUTOMATION FRIEND OF WORKER

Automation, a word which often strikes fear in the heart of the American factory employee, actually describes a burgeoning machine age which is the worker's best friend, according to a report published by the National Association of Manufacturers, 2 E. 48 St., New York City.

A word that means many things to many people, automation is used to refer to any automatic operation of productive machinery. Its widespread use, together with talk of "workerless factories," has caused many industrial employees to fear that mechanical robots will supplant them and leave them jobless.

Entitled "Calling All Jobs," the 24-page, two-color NAM booklet is designed to end such fears. It emphasizes that so-called workerless plants are a myth and will remain so in the future. It stresses the fact that industrial machinery has undergone a continuous process of improvement and that this merely has become more pronounced in the past six or seven decades.

The booklet uses historical examples to show that every improvement of the machine age which has increased productivity has increased the total number of jobs, thus proving that automation is the friend of the worker rather than his enemy.

HELP FOR DRAFTSMEN

Engineers and draftsmen may now secure complete sets of 68 new tracing templates of De-Sta-Co. toggle clamps.

These template kits are available in any one or all of three sizes—full-half-or quarter-scale. All sets of template drawings come in very sturdy manilla envelopes and are available on request to any engineer or draftsman, as well as every engineering or designing organization.

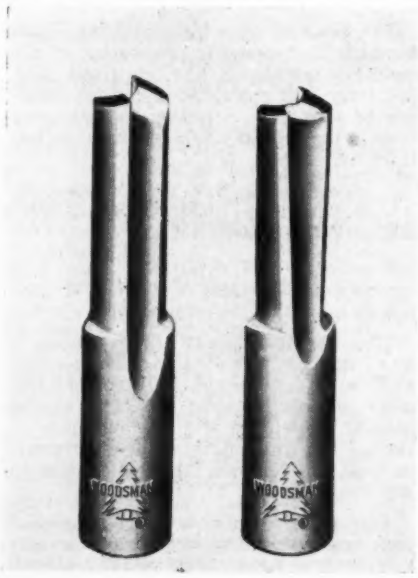
Engineers, draftsmen, and engineering and designing organizations may secure free sets of De-Sta-Co. toggle

clamp drawings by writing Detroit Stamping Co., 312 Midland Ave., Detroit 3, Michigan.

The man who claims he's boss in his own home will lie about other things too.

CARBIDE TIPPED HELICAL ROUTER BIT

Designed so the cutting edge has a compound radial and helical angle to give a downward shearing action on face veneer and laminated plastic top operations, the North American carbide tipped Helicut bit now is available in the improved, curve-flute style. Added to the curve-flute which guides the chip by its natural contour, is a highly polished flute surface to eliminate chip-flow resistance. The result of these research developments is a reduction in power formerly consumed in chip compression with the square flute design. This power saving has proven a significant factor in keeping router machines to maximum operating speeds, besides resulting in easier and faster cutting performance of the tool.



The improved router bit is the result of research on aluminum alloy cutting that has proven of equal value in the clean cutting of other materials such as veneers, plastics, hardboards, and fibreboards.

The North American Helicut style router bits are stocked for immediate delivery. For further details, write North American Products Corp., Dept. WD, Box 210, Edwardsville, Illinois.

WOOD RESEARCH BOOKLET

Forty per cent more lumber manufacturers were sponsoring individual research projects at the Teco laboratory during the first ten months of 1954 than in the comparable period of 1953, according to the new booklet, "This Is Teco," just published by Timber Engineering Company, research affiliate of the National Lumber Manufacturers Association.

Commenting on this increase in private research by lumber firms, in addition to cooperative research through their respective trade associations, the booklet points out, "Inquiries to laboratory officials indicate a continuing upward trend in research by individual lumber companies seeking better utilization of their stumpage, and improved products with which to meet increasingly aggressive competition."

In addition to listing the various types of projects sponsored by lumber firms throughout the nation, the booklet cites specific benefits accruing to private firms, wood industry associations, and military agencies, through wood research at the Teco laboratory.

Copies of the booklet, "This Is Teco," are available on request to Timber Engineering Company, 1319 - 18th St., N.W., Washington 6, D. C.

Money blown in on wet nights is money not saved for rainy days.

to up-to-date information

about equipment and supplies as featured by our advertisers in this particular issue. All of our advertisers will be glad to send information about their products, but we have listed the following firms because they have mentioned booklets in their advertising copy.

If you wish, circle the booklets you wish to receive and send to Readers' Service, WOOD WORKING DIGEST

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Marcelcy, Inc., page 176, Catalog.

BORING MACHINES
Greenlee Tool Company, page 88, Catalog.

CLAMPS & CLAMPING MACHINES
Black Brothers Co., page 7, Bulletin.
Adjustable Clamp Co., page 82, Catalog.
James L. Taylor Mfg. Co., page 159, Catalog.
Cincinnati Tool Co., page 175, Catalog.

CUTTERS & KNIVES
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Ekstrom, Carlson & Company, page 110, Catalog.
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Moak Machine & Tool Company, page 189, Booklet.

DRY KILNS
Standard Dry Kiln Company, page 12, Catalog.

DUST COLLECTING SYSTEMS
Aget Mfg. Company, page 108, Literature.

FASTENERS
Saranac Machine Co., page 27, Bulletin 112-A.

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GRINDERS
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U. S. Plywood Corp., page 15, Booklet.
Upson Co., page 104, Sample.

HIGH FREQUENCY BONDING EQUIPMENT
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Wm. Patent Crusher & Pulverizer Co., page 19, Brochure.
American Pulverizer Co., page 56, Bulletin.
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JOINTERS
Oliver Machinery Co., page 1, Bulletin.

MOISTURE METERS
Weston Electrical Instrument Corp., page 26, Bulletin W7B.

MOLDERS
G. M. Diehl Machine Works, page 16-17, Bulletin No. 155.
Mattison Machine Works, back cover, Bulletin.

NAILING MACHINES
Ford Machinery Corp., page 93, Circular.

PLANERS & SURFACERS
Baxter D. Whitney & Son, page 13, Bulletin D1.
Powermatic page 18, Literature.
Buss Machine Works, inside back cover, Bulletin.

PLYWOOD
Keller Products, Inc., page 140, Brochure.

PLYWOOD PRESSES
Columbia Div., page 132, Bulletin HD-5.

PORTABLE ELECTRIC TOOLS
Black & Decker, page 30, Catalog.

RIPPERS
Mattison Machine Works, back cover, Bulletin.

ROUTERS
Porter-Cable Machine Co., page 65, Manual.

SANDING MACHINES & EQUIPMENT
H. B. Smith Machine Co., page 2, Literature.
National Air Sander, Inc., page 123, Catalog.
Sand-Rite Mfg. Co., page 124, Circular.

SAW BLADES, SAWING MACHINES & EQUIP.
Beach Mfg. Co., page 4, Literature.
Victory Carbide Saw & Tool Co., page 20, Catalog.
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Duro Metal Products Co., page 173, Catalog.
Mattison Machine Works, back cover, Bulletin.

SAW SHARPENERS
Wardwell Mfg. Co., page 160, Bulletin Y-18.

SCREWS & FASTENERS
Southern Screw Co., page 101, Samples.

SHAPERS
Moak Machine & Tool Co., page 189, Booklet.

TABLE EQUIPMENT
B. Walter & Co., page 181, Sample.

TACKERS & STAPLERS
Fastener Corp., page 31, Catalog.
Powers Wire Products, page 158, Catalog.

VENEER MACHINERY
Mereen-Johnson Machine Co., page 8-9, Bulletin.

WOOD TREATING CHEMICALS & EQUIPMENT
Protection Products Mfg. Co., page 22, Folder.

WOODWORKING MACHINERY
Woodworkers' Tool Works, page 103, Catalog.

Mechanics Through The Ages

BEFORE ASSUMING JOURNEYMAN STATUS, AN APPRENTICE IN THE 13TH CENTURY PARISIAN GUILD OF MILLSTONE MAKERS WAS GIVEN SEVERAL SMART RAPS ACROSS HIS SHOULDERS BY A ROD WIELDED BY THE MEMBER WHO HAD LAST BEEN ELECTED.
TO OVERCOME RESISTANCE TO HIS NEW-FANGLED STEAM ENGINE, CORLISS, IN THE EARLY 1850'S, AGREED TO TAKE PAY FOR HIS EQUIPMENT OUT OF THE MONEY IT SAVED ON FUEL. FROM ONE ASTONISHED CUSTOMER HE RECEIVED, IN FIVE YEARS, $19,734.22 FOR AN ENGINE WORTH $7,000!
As early as the 1300's,
-A CRAFTSMAN OF NUREMBURG, GERMANY WAS MAKING WIRE BY DRAWING POINTED RODS THROUGH HOLES IN A METAL PLATE. 3 CENTURIES LATER THIS WAS STILL A COMMON PRACTICE.
AL REETZ-

Good News Gets Around...

Moak Single Spindle Shapers and Speedikut Cutters

TO MAKE FAST-SELLING SHAPED WOOD PRODUCTS

What a combination!

***Moak Single Spindle Shapers*—with speeds up to 12,000 rpm, precision ground table, simple adjustments.**

***Moak Speedikut Cutters*—precision ground from hardened 18-4-1 high speed steel, undercut to maintain original balance when re-ground, and true form relieved.**

Together, they produce rapidly and at low cost the various shapes for furniture, moldings, copings, cabinet-work, sash and paneling that add smart finishing to woodwork.

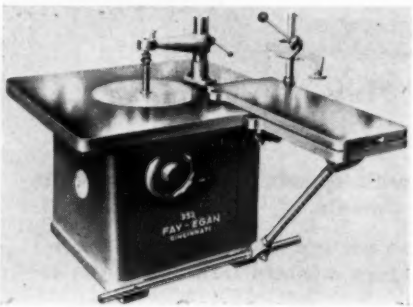
***Get the facts* on Moak Shapers and Speedikut Cutters. Write for colorful illustrated booklets today.**

FAY & EGAN SHAPER

A new, ball bearing, 4-speed single spindle shaper, known as Model No. 952, has been announced by J.A. Fay & Egan Company, Dept. WD, Cincinnati 2, Ohio. The new shaper is the latest addition to Fay & Egan's modern "900 Series" of woodworking machinery.

This shaper offers spindle speeds up to 8200 r.p.m. and is said to offer outstanding versatility in a wide range of furniture, chair, picture frame and similar woodworking operations.

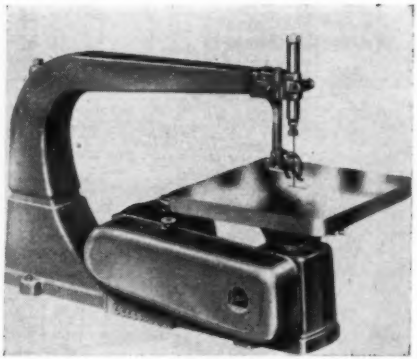
Among features of interest to woodworking plants, the following are pointed out: The heavy, one-piece cast iron column encloses the motor and drive and supports the precision 36" by 40" table. Table attachments and features include: table rings allowing up to 18" swing, quick-acting table clamp, adjustable swivel fence with unlimited working range, an auxiliary traveling extension table for large work and overarm steady bearing.



The 1⅛" detachable cutter spindle has a height adjustment of 4¾" and is "self-centering." The spindle housing is easily adjustable in gibbed ways, yet locks positively in working position. The bearings are precision ball bearing types. The spindle assembly is dynamically balanced for high speed operation. Spindle height is quickly adjusted by means of a large handwheel.

Motors ranging from 4½ to 6 H.P. are recommended for various applications. Motor controls are conveniently located at the edge of the table. The reversible motor allows reversing the rotation of the spindle if desired for a special operation.

JIG SAW



The new Atlas 24" ball bearing jig saw cuts wood, composition, plastic, fibre, bone, ivory or metal. It is manufactured by the Atlas Press Co., 2627 N. Pitcher St., Kalamazoo, Mich.

The 14"x14" ground grey iron table tilts on two widely spaced trunnions that do away with troublesome table "flop". Table tilts 45° to right, 15° to left, swivels 90° to handle angular cutting of long stock.

Patented chucks are unusually versatile, and easy to use. Blower has new power and provides a continuous stream of air that keeps layout lines perfectly free of saw dust.

Condensed specifications are: 24" throat capacity, 2¼" depth of cut, blade length 6" or less, four speeds, operates from 1/3 h.p., 1725 r.p.m. motor.

GLUING MACHINERY

A comprehensive line of clamping, gluing and laminating machinery is described in a new bulletin being offered by Black Brothers Company, Mendota, Illinois. The six-page folder illustrates equipment from bench type spreaders and electric glue pots to large machinery such as the firm's cold presses. In this one piece of literature the manufacturer has pictured representative machines of the entire line.

Specific bulletins for each type of equipment are available and the reader is referred to such material for additional information.

The Market Place

Rates for Classified Advertisements

Lists of Used and Rebuilt Machinery, either For Sale, Wanted, or For Exchange, set in uniform style, will be published in the Classified Section at the rate of $7.50 for name and address and a five line advertisement. For additional lines, only 75c per line.

DISPLAY ADVERTISEMENTS: 1 inch (Minimum), $8.50; 2 inches, $17.00; 3 inches (Maximum), $25.00.

Write directly to those offering the machine for sale, for prices and full descriptions. If what you seek is not advertised, write Hitchcock Publishing Company, 222 E. Willow Ave., Wheaton, Ill., making known your wants on either new or used machinery and the publisher will gladly assist you.

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P.O. Box 230 **Asheville, N.C.**

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Borers, Greenlee 369-4 ft. m.d.
Borers, Greenlee No. 370 6 ft. horiz. dmd
Borers, Moak SS 2 Spindle horiz. dmd
Boring & Sawing, McKnight 26F dmd
Carvers, Yates-American single spindle bb-dmd
Clamps, Handy No. 71 revolving
Clippers Coe 88" bd. and motor
Dovetailers, Dodds, 20 spindle
Frequency changers, 30 KW dmd
Glue Jointer, Diehl No. 66 bb.-dmd
Glue Jointer, Jenkins No. 343A bb-dmd
Glue Spreaders, Francis 12" dmd
Jointers, Glue, Yates-American No. 213 bb-dmd
Jointers, New Moak 12" bb-dmd
Jointers, Porter 16" and 24" bb-dmd
Lathe, Yates No. 74 bb-dmd
Lathes, Mattison 57D
Mortiser, Sidney, single spindle pb. bd.
Mortiser, Greenlee No. 228 vertical bd. & motor
Mortiser, New Britain No. 7 bd. & motor
Mortiser W&M No. 288—5 spindle Horiz. dmd.
Moulders, Mattison No. 222, 6" bb-dmd
Moulders, Yates Amer. C88, 8" BB DMD.
Moulders, Yates-American C-89—6" bb-dmd
Planer, Facing, Yates-American 36" with Jackson & Church feeder on base, bb-dmd
Planer, Whitney 36" single round head bb-dmd
Planers, F&E—30" double pb. bd. & motors
Planers, Berlin 36" round head dmd
Planers, New Crescent 24" bb-dmd
Planer, F&E No. 156 36x7 dmd, round head
Planer-Matcher, Yates A1-15"x6" round heads pb. bd.
Redrier, Merritt 12 plate 36x72
Routers, Defiance single spindle high speed dmd
Sanders, Niagara brush, bb-dmd
Sander, 48" double disc, dmd
Sander, Smith 49" 3-drum endless bed, bd
Sanders, F&E 60" 3-drum roll feed, dmd
Sanders, McKnight single drum 24"x16" dmd
Sander, Porter Cable vertical oscillating dmd sgl. spdl.
Sander, W&M No. 171 belt bb., md.
Sanders, Yates 431—49", 3 Drum, Endless, DMD.
Saws, F&E No. 500 variety bb-dmd
Saws, Hermance Gang Rip, pb. & motor
Saws, New Delta-Crescent 12" tilting arbor, dmd
Saws, New Multiplex 40A & 50A
Shaper, Defiance double spindle, bb-dmd
Shaper, Whitney No. 389, double bb-dmd
Shapers, New Moak single spindle bb-dmd
Shapers, Greenlee No. 180 double bb-dmd
Shaper Whitney double spindle, bb., md.
Sticker, American No. 1, 1 side 4" pb. bd.
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Tenoners, Yates-Amer. No. 55 sgl. end, bb-dmd
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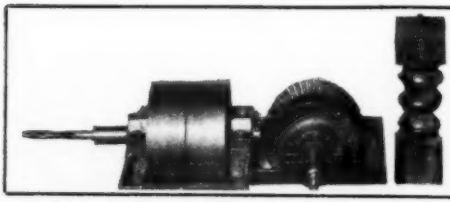
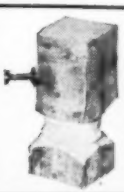
Tenoner, Hayes 6 ft. dbl. with copes, pb. bd. & motor
Veneer Press, Francis 84x48

Many other items, send your inquiries

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Borer, Fischer, 6 spindle horiz., 28", $350
Clamp, Handy No. 50 Drawer and Case, $125
Clamp, Handy 7½ ft. revolve glue, $300
Dowel Mach., Bell No. 4, power feed, $250
Glue Spreader; Francis 8 in., MD, $35
Lathe, Bignall Auto. Variety, MD, BB, $400
Lathe, Kline No. 52 auto Variety, $150
Mortiser, New HC vertical, $100
Mortiser & Borer, American horiz. 5 hp, HC MD, $300
Sander; Nash dowel and handle, $300
Sander; Nash dowel and handle, $300
Radial saw, Comet 5 HP, single phase, $400
Belt sander, Mattisen No. 131, hand block, $185
Saw, Roll table cutoff, $75
Screw Driver, Reynolds, hopper feed, MD., $100
Shapers, BB, MD, Single small, $75 to $125
Sticker, Smith, light, 6 in., 4 side, $250
Swing Saw, Towsley DMD BB, $150
Variety saw, heavy duty, with jointer, MD., $175

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SURFACER—30" No. 32D Smith ball bearing single; No. 2 Fay & Egan 24" single

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Auto Nailer "Blue Model," M.D.

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Whitney No. 250 Double Spindle, D.M.D.

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Yates-Amer. No. S-23 43" 3 dr. roll feed D.M.D.
Yates No. 421 6-drum with motors
Fay & Egan 30" 2-drum end. bed., M.D.
Yates-A. 2433 43" 3 dr. End Bed Sand., D.M.D.
American No. 2 Disc and Spindle Combination

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Whitney No. 61 tilting arbor, D.M.D., B.B.
Walker Turner 10" Tilt Arbor, B.B., M.D.

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Sidney No. 720 Straight Line motor on arbor
Multiplex Model 40A, 1½ HP motor
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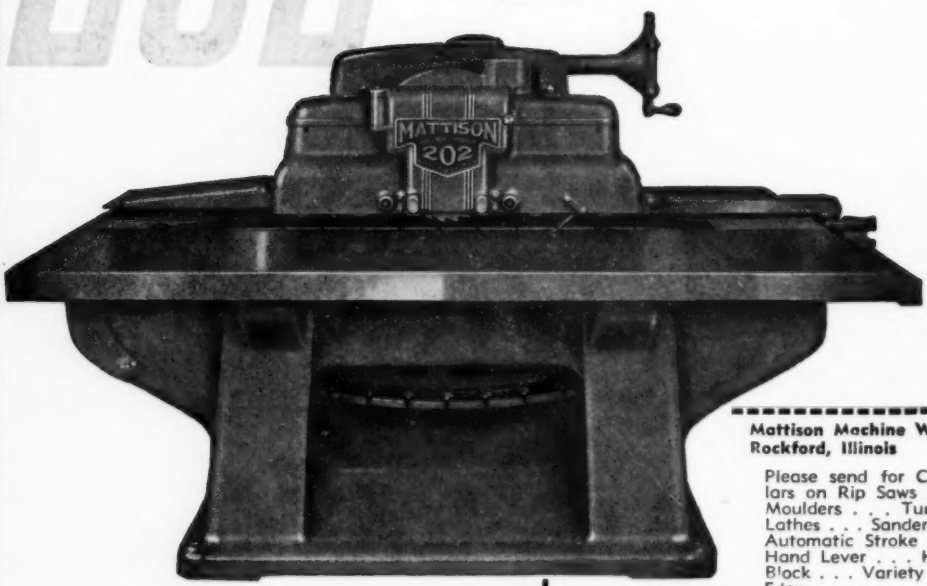

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